

The Orchadian

Volume 17, Number 11

www.anos.org.au

March 2014

Official Journal of the Australasian Native Orchid Society

Celebrating 50 years of cultivating, studying and promoting Australasian Orchids.



Thynnoturneria armiger male attempting to couple with the pseudogenital process of *Paracaleana minor*.

Photograph by Colin Bower



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Official Journal of the Australasian Native Orchid Society Inc.
Founded August 1963

www.anos.org.au

Dedicated to the Study and Conservation of Australasian Native Orchids
Print Post Approved: 100000950, ISSN 0474-3342

Patron: David Cannon

September 2013

Volume 17 Number 9

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Greg Steenbeeke
orchadian@dodo.com.au

Membership Officer

Greg Steenbeeke
Membership enquiries should be directed to the
Treasurer's e-mail: agroffen4@bigpond.com

Conservation Officer

Anne-Maree Mitford
anne-maree.mitford@exemail.com.au

Ira Butler Chair Webmaster

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rickwinch@westnet.com.au

ANOS Correspondence

A.N.O.S. Inc.
PO Box 2088
Keperra QLD 4054

Subscription Rates (in AUD\$)

Australia \$50
Asia/Pacific \$60
Rest of World \$70

Refer to www.auspost.com.au for application
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The Orchadian is printed at the University of
Wollongong.

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1/6 Page \$120
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Editorial

What a summer! The Bureau of Meteorology tells us that 2013 was the hottest year in more than a hundred years of records. Few of us will be surprised at that, and the heat only continued into 2014. The conditions at home have been warm to hot and dry. We had virtually no rain in summer—usually our wettest period—and this made a lot of problems with maturing growths.

This issue may be a bit challenging for some of you, with a serious consideration of the effect that the latest release of the *Genera Orchidacearum* series (GO volume 6) will have on the names we use to describe our plants. Some will not agree, or will complain that, yet again, the taxonomists have made their labelling 'wrong'.

The announcement of the Australian Orchid Foundation annual essay prize is given here, along with the notice of the topic for this year's competition. The first-placed essay from 2013 is presented in this issue. I felt the ties to some historic Australasian orchid people certainly justified it being here—even if a lot of the discussion is about non-Australasian orchids.

Dr Colin Bower provides a wonderful set of photographs and text describing the pollination of the small duck orchid. I am sure that the 'sex on the cover' may have already caught your attention!

A recent symposium in western Victoria discussed issues relating to the conservation of orchids. Alan Stephenson provides us with a quick synopsis of the event. This also leads on to the announcement of the ANPC Orchid Conservation program, with the Australian Network for Plant Conservation inheriting the organiser role of the program following on from the Wimmera Catchment Management Authority. There is a great opportunity here for ANOS to maintain a critical role in this ongoing program.

A second article on *Sarcochilus hartmannii* breeding is presented by Yin and Sau-wan Chan.

They researched this topic for their judging course presentation and this will provide the reader with a good understanding of the dominance, and importance, of this species in the breeding of our most successful modern *Sarcanthinae* hybrids.

I have also received photographs and text from the National Registrar about some of the awards given out to species by the judges. These include some stunning plants which regrettably the photographs do not do justice—even though Bill Dobson has done a wonderful job trying to capture them.

After a question put to me at the Sydney Group meeting I give a brief account of how one of the orchids in the Australasian stable gained its name. It allows me to give insight into an older system that gave recognition to proper names that has been discontinued now for some time.

Other articles provide a review of the 50th anniversary of the Sydney Group, attended by a number of the life members and other dignitaries. This was a great night, with tales recounted and friendships renewed.

I also draw your attention to the announcement of the dates for this year's *Dendrobium speciosum* Spectacular and Show at the Walmsley's place on the mid-north coast of NSW.

A mention has been made that the cover of last month's issue bore an image of a hybrid which bore a new grex name, which was not used in the print run. This is true—it did have a name at the time it went to the printer. I take the time to check the RHS register online as I insert photos that bear names only as hybrid combinations, and at the time it was being compiled, I found no name that applied to the hybrid. For the sake of completeness I can now tell you that the Grand Champion of the show is registered as *Dendrobium Sweet Poly*, registered on the 5th of September 2013.

Greg Steenbeeke

President's Report

As I write this gentle rain is falling preceded last week by some heavy showers and so the local drought is broken. Unfortunately a lot of areas are still drought stricken, speaking to Frances Wilde and Neil Anderton (Geelong ANOS) today they confirmed this, Frances reporting that she had lost new growths on a lot of her dendrobiums, collapsing from the extreme heat. I was fortunate enough to attend Geelong's November meeting and was impressed by the orchids on display. I was asked to pick my choice which was extremely difficult. I settled on Frances' *Sarcochilus dilatatus* which was not only very well grown but had eight (yes 8) racemes of flowers. Knowing from personal experience how difficult it is to grow this species I was impressed. As well as a lot of very good *Sarcochilus* hybrids a plant of *Diuris fragrantissima* was exceptional with breathtaking light "lilac" coloured flowers

Neil Anderton gave a presentation on a survey of South West Victoria, mainly burnt areas. As good as our artificially bred orchids are you will still see some beautiful sights whilst bushwalking and this survey by Neil and members of Geelong ANOS highlighted this.

Our National judging Registrar Ray Clement has introduced national teleconferencing for state

registrars and should be an ideal way to actively co-ordinate all ANOS judges. This teleconference has already highlighted some matters that will need attention.

The *Dendrobium* beetle survey goes on with forms trickling in. I appeal to all orchid growers to support this project for the common good. Ray Clement has been kind enough to allow me to set further trials on attractants at his Tinonee Nursery. I purchased many orchid fragrances whilst in Thailand last year and these are being tested now (preliminary results disappointing). If anyone observes *Dendrobium* beetle being attracted to anything other than orchids please let me know.

I still get much pleasure from bushwalking and late last year was lucky enough to see a lovely clump of *Calanthe triplicata* (photo below) in Ourimbah state forest. A friend of mine upon seeing these photos was inspired enough to write a poem about them - I hope you all like it. I hope these photos will inspire more people to get out into the bush (whether it be The Grampians, The Watagans or the Atherton tablelands) and see the beauty that is there, happy growing.

Tony Clarke



Among shady banks and ledges

Orbs of white, skirted with
green

Glow, among bracken and
sedges

Waiting for that special time, to
be seen

By those privileged, fortunate,
smarter

Simple beauty of green and
white

That we know as *Calanthe*
triplicata

Bathed by silence, a wondrous
sight



2013 AOF Essay Prize Winners

The winners of the 2013 AOF Essay Prize were announced at the Annual General Meeting of the Australian Orchid Foundation held on October the 27th in Melbourne.

First prize was won by Chris Heysen

from Auldana in South Australia.

Second prize was won by Greg Steenbeeke from Narellan in New South Wales.

Third prize was won by Arthur Stafford from Eskdale in Queensland.

An AOF Special Award was also announced and the recipient of David Jones book '*Starting Out With Orchids*' is 13 year old Brooke Felsch a member of the Woodburn Orchid Society.

Entries were received from every state and territory and the judges had a very challenging task of selecting the winners. The topic for 2014 is "**My Favorite Orchid**" we would like to hear about an individual, genus or group of orchids you are particularly interested in, explaining the fascination.

Our Life's Journey with Orchids

By Chris Heysen (cheysen@adam.com.au)

The air hung heavy in the early morn – the smoke from overnight fires lying horizontally like a faint silvery river suspended a few hundred feet above the wide valley floor. There was a stirring of the quiet in the village below, an occasional dog barked gently, a creaking of timber as someone moved in one of the huts fashioned from rough hewn logs and woven bamboo that served as homes to 200-odd people. As the first rays of the sun touched the mountain tops and the light began to filter into the valley the leader of the village chooks announced the arrival of the new day in his usual harsh and loudly crowing voice.

The village quickly came awake and there soon developed a growing sense of excitement. As I rubbed the sleepy dust from my eyes I asked what was happening and was told that this was the day that "*Missus belong Plaua*" (The Orchid Lady) would be arriving - as soon as the clouds lifted and allowed the small Cessna to fly in from Lae and land at the small bush airstrip across the creek from the village. Everyone was to be "on their toes" and dressed in their finest to

greet her. It was obvious from the hubbub that she was greatly respected, even loved – but also, perhaps, a little feared.

The place: Vagau – a village at approximately 5000 feet (around 1500m) above sea level in the headwaters of the Snake River in the Morobe District of Papua New Guinea.

The year: 1964. I was a 21 year old Agricultural Officer based at Mumeng, about 14 - 15 hours walk away – there was no road, just walking tracks in the jungle. I was on patrol – walking from village to village and staying in each place for a few days while advising the people, who were basically subsistence farmers, how to grow coffee – a new cash crop for the area.

I'd never met this *Missus belong Plaua* but thought I'd better hang around until she arrived in case there was anything I, as the only English speaking person within 100kms or so, could do to help.

A couple of hours later the faint buzz of an engine could be heard, growing louder as the little plane circled the valley to lose height



Arachnis species in Lae Botanic Gardens (1964) (Ed.: while the species *A. beccarii* is native to New Guinea, this is probably another species in cultivation)

before landing. The whole village was lined up at the side of the airstrip as a group of three or four women, all dressed in well worn, practical, bush type clothes, and strong walking boots alighted from the Cessna. In their midst was a large lady who immediately started giving orders in a loud stentorian voice, and in perfect Pidgin, to all and sundry. She obviously needed no help at all.

She spied me among the waiting throng – I wasn't hard to see being the only white face in the sea of brown. "And who are you?" she demanded. I tentatively introduced myself. "Ah ha – *Didiman!* [Pidgin English for Agricultural Officer] - you can help organise some of the *bois* [village men] to find orchids for us!"

Thus was my first meeting with Andrée Millar! She and a few friends were there to collect orchids for the Lae Botanic Gardens – especially dendrobiums (both soft and hard cane) and bulbophyllums. The mountains around Vagau went up to nearly 7,000 feet, (over 2,000m), in parts heavily forested but in parts also open grassland, and were ideal sites for many relatively rare orchids both terrestrial and epiphytic – not to mention numerous species of rhododendrons growing in the open grassed areas and on the edges of the jungle. Trained in agriculture, I had only a very rudimentary knowledge of botany but was fascinated by the

plants that the villagers collected for these women. Many were in flower – the typical antelope-type dendrobes and huge bulbophyllums (most with rather non-descript flowers, at least to my way of thinking). Also a number of lovely *Spathoglottis* terrestrial orchids.

Next day I had to move on to the next village to continue my real work – but my interest had been sparked and a month or so later I followed up on Andrée's invitation to visit her at the Lae Botanic Gardens. Here she had a wonderful collection of exotic plants – and especially orchids – not only from New Guinea but from all over South East Asia. It was my first exposure to vandas, *Arachnis*, ascocentrums, renantheras, etc. Their beautiful and exotic looking flowers captured me - I was smitten!!

Later that year I returned to Australia on leave – to marry my long time sweetheart and bring my beautiful young blonde bride back to New Guinea. We'd known each other since early high school but in the lead up to the wedding I discovered something that I'd never known before – Lyn's favourite flower was the orchid! Her wedding bouquet was a beautifully made arrangement of cymbidiums.

On return to PNG Andrée took us both under her large and protective wing. Her own children were in Australia studying at University so in a

way we were almost surrogates for them. Who were we to complain? In our spare time we collected orchids from the Mumeng/Bulolo area for her (this was long before CITES was even thought of) and she provided us with cuttings etc. from her more exotic (to us) plants from across Asia.

In a little over a year we had a large collection of our own – mostly PNG natives but also many exotics. On one particular day a young lad brought us something we'd never seen before – a beautiful white orchid with about 10 flowers on a single spray. The leaves were large, elongated and flat – and there was no long cane or pseudobulb as there was with all the other orchids we'd found in the area. For Lyn it was love at first sight! Andrée subsequently told us that this was *Phalaenopsis amabilis*. Although we've had many, many other orchids in the intervening years it is this beautiful orchid that has really driven our dreams for what we'd like to grow.

Unfortunately, as was common in the public service in PNG, we were soon to be transferred – this time to a lowland area not far from Rabaul in East New Britain. A limited shipping allowance was insufficient to take all our collection - so we bequeathed many of our orchids to the Botanic Gardens in Lae.

The selected remnants of our collection – still around a couple of hundred plants - were packed into wooden crates - doing what we could to give them some aeration. It was North West Monsoon season with high temperatures and high humidity. Our orchids, most of which were acclimatised over many generations to life at 1000 metres or more, barely survived the sea journey. Many died of rot. It was quite devastating to see them when we opened the crates several weeks later.

However some did survive and we built a new, very open (to maintain maximum air movement) shade house at our new home. The local area did not seem to have a great variety of native orchids – certainly those we did see were of little interest after the wonderful dendrobates and our special phally from the highlands of Morobe District, and of course we

no longer had Andrée to guide us.

We struggled on for a year or two but when we were transferred yet again we decided not to try to take our remaining orchids with us.

But life is full of interesting twists and turns and in 1972 we were posted to Port Moresby. By happy coincidence only 6 months before this Andrée Millar had been appointed curator of the brand new National Botanic Gardens located in the grounds of the University of PNG at Waigani – an outer suburb of Port Moresby (and only 2-3 kilometres from where we now lived). There she was establishing what was to become an outstanding orchid collection – both PNG natives and other exotics from Asia and the rest of the world – along with what, in years to come, would be a national treasure of tropical trees and shrubs and other plants from all over the country. At the time of PNG's Independence, in 1975, she was awarded an OBE for her work in obtaining worldwide recognition for the flora, and especially the orchids of PNG.

It was wonderful to renew our friendship – and of course she repaid our collecting of orchids for her years before by helping us to develop a new collection of our own. The climate in Port Moresby is similar to much of northern Australia with a distinct and quite extended dry season and a 4-5 month wet season – annual rainfall is a little over 1000mm (less than 40 inches), about the lowest of anywhere in PNG. Like Darwin, the rainfall is during the hottest months, with the cooler winter months being quite dry. We were able to grow many of the Asian vandaceous-type orchids with little or no shade. They were mostly grown in raised beds of roughly chopped coconut husks with wire trellises to support the plants. A six foot long bed full of a hundred or so plants of *Vanda* Miss Joaquim in full flower is a sight to warm the cockles of your heart.

Eventually it became time to return to Australia – PNG had been an independent country for two years and increasingly wanted to replace expats with local people so there were no real long-term career prospects in the country. We knew that we couldn't take our orchids back to

1966 –
Phalaenopsis
amabilis
collected at
Mumeng in
PNG



Adelaide as we didn't even have a house for ourselves let alone a heated and humidified glasshouse that would be required to grow the

orchids we were so proud of in Moresby. We

gave a whole lot of them to a friend who was going to live in Far North Queensland - on the understanding that we would one day claim some cuttings back from her. Sadly, we lost contact, and by the time we were able to think about building an appropriate place for tropical orchids (more than a dozen years later) we had no idea how to find her.

On leaving PNG in May of 1977 we spent three weeks or so tripping through South East Asia and were astounded by the orchid gardens in Thailand, Malaysia and especially Singapore. Acres upon acres of wonderful exotic plants flowering away like there was no tomorrow. We have returned many times since and these places never fail to thrill. The Mandai Gardens (Singapore) and the Orchid collection in the Botanic Gardens of Singapore are especially wonderful places to visit.

Within weeks of our return home to Adelaide we had already purchased a small shade house and we started visiting Syd Monkhouse's Adelaide Orchids at Happy Valley, Valley Orchids (near Reynella) and Johnston Orchids, then at Highbury. We quickly built a collection – this time based on cymbidiums with the occasional cold-growing *Cattleya*. We moved into our new home at Banksia Park at the end of that year and had a whole new garden to establish – so the orchids took somewhat of a back-seat for a

while.

Workwise I had taken a 180 degree turn – from tropical agriculture (tea, coffee, cocoa and coconuts etc.) to Mediterranean-climate, dry land agriculture – broad-acre cropping and livestock systems became my specialty. I spent 6 months or so each year away from home and travelling to the extremely dry countries of the world (North Africa and the Middle East) with nary an orchid to be found anywhere. But Lyn kept her love for orchids and our small collection of cymms grew over these years to probably a couple of hundred plants which gave us much pleasure.

And then another upheaval! In 1985 I had the chance to take up a position as Project Leader of an agricultural development in Jordan. But we'd have to rent out our home. What to do with the orchids? No tenant could be expected to look after them. Luckily we had great neighbours who had become close friends and they agreed to look after our orchids. So on one very busy weekend we dismantled the shade house, re-erected it next door and moved all the orchids to their new home. Four years later, on our return to Australia, we retrieved them again – all in very good order with names intact and looking healthy. We offered half to our friends in return for their efforts but they declined and never grew orchids of their own – strange, but we were very grateful – they had really done a

great job.

By this time Johnston Orchids had moved to Houghton – in the hills not far from where we then lived. We were frequent visitors – firstly for cymbs but we became increasingly interested in Dean's more exotic orchids. One day he showed us his large hot house – it took our breaths away – with hundreds upon hundreds of beautiful phally's – seemingly endless flowers. This was at the time when Johnston Orchids were probably the premium grower of phallys in SA if not in Australia. They had achieved many awards for plants of their own breeding. Remember – phally's were Lyn's first love in orchids. To see the look on her face when we walked into that hothouse was something really special. So what could a guy do?

We were now in a position, both financially and time-wise, to look at building a hot house so I set about drawing up plans and buying the required "stuff". It was a simple lean-to type of house built in a 3 metre space between one wall of the house and a high retaining wall on the far side – about 4 metres long, timber frame, with sheets of flat, slightly opaque, fibreglass attached to the outside of the frames. On the inside we stapled clear poly film to provide a double wall. An old evaporative cooler was inserted in one end wall – I rigged this with a float valve to the water supply so that we didn't have to continually refill the water reservoir. Heating was via a MaxiGrow blower/heater (this was in the days before expensive electricity!) Mistlers, supplied by pump from our rain water tank, provided further cooling when needed.

Nearly twenty five years after seeing that first phally – the *Phal. amabilis* from the jungle near Mumeng - we once again had a place where we could grow our own. Our collection of tropical orchids grew, and on Dean Johnston's advice, we joined our first orchid club – The Orchid Club of South Australia (OCSA) – in 1992. It was wonderful to be part of a group of like minded people although, in those days, the club was huge and novices like us felt a bit lost in the throng.

But we did well and won a couple of monthly flower competitions in Second Division – once

with a lovely *Cattleya* we'd brought down from a holiday in Darwin – a beautiful jade green with magnificent perfume (I don't remember the name) and once with a New Guinea-type *Dendrobium*. The latter win, coincidentally perhaps, happened to be on the night that Andrée Millar was visiting the club from her home in Queensland. We renewed once again our friendship with her after 15 years. She was now an old lady but as feisty as always and as ever ready to share her encyclopaedic knowledge of orchids.

Sadly she passed away only two or three years later in 1995 but we were so grateful that we'd once again connected with our old friend – and that she had "blessed" our humble attempts to follow her original inspiration to us all those years before. It is many years ago now but I have tears in my eyes as I remember those times.

During this time Lyn had developed a long time interest in flower arranging. I well remember her wonderful skills with orchids in particular. She did several weddings – one with orchids specially flown in from Darwin and another totally with Sturt Desert Peas that were spectacularly beautiful.

Then came another major turn in our lives: having recently retired from the company I worked for, and set up as a freelance consultant, Austrade (The Australian Trade Commission) offered me the position of Senior Trade Commissioner, based in Cairo but responsible for Egypt, Lebanon, Syria, and, later, Libya. Yes, I know that all those countries sound scary today but this was late 1998, a time of relative peace in the Middle East. So, once again we packed up our stuff and headed off for foreign shores. This time our son, his wife Gail, and new baby son, Dylan (our first grandchild), were to live in our house - so we had no qualms about the orchids being properly cared for.

Our four years in Cairo were totally devoid of orchids – there didn't seem to be any orchid culture in the country. The only orchids we ever saw were cut flowers from either Singapore or Amsterdam. No phallys – only *Vanda* types and Singapore dendrobiums. Of course we holidayed

occasionally in Thailand and always returned to Egypt with a box of orchid flowers – but as you all know this is a fleeting tease for the real thing – a growing, flowering plant that lasts for weeks (or months if they're phallys) in your home.

At the end of this time, late 2002, we had the opportunity to take up a post in Dubai, which, as a tax free country, was simply too good to pass up. Our son and his family wanted to move back to their home so we decided to sell the house we'd owned for 25 years. Another friend stepped in and offered to look after the cymys but there was no-one able to look after the hot house orchids. We advertised them (several thousands of dollars worth) and the only offer was for a few hundred from a man who was going to take them to Bali! Lyn nearly cried as he loaded them into his trailer – one piled on top of the other like so many bits of flotsam in the sea, with no care about their welfare.

Although Dubai was totally different to Cairo in nearly every way – a clean and totally modern city where everything worked – we were never the less very pleasantly surprised when the local garden centre was selling live phally plants – no names and not especially good varieties but phallys all the same - no doubt imported from Asia or Holland. What can you do when confronted by a phally that just sits up and says "take me home."

We had no hot house (never needed in Dubai) and knew that a shade house would be way too hot for them with day time temperatures during summer in the high forties every day. Humidity was also high but this would not have been enough to counteract the extreme heat. So our small but once again growing collection was housed inside our home - which was more or less permanently air-conditioned. Temperature was therefore no problem and we kept them on trays of pebbles with water in the trays to maintain humidity. At peak we probably had a couple of dozen plants like this and several of them re-flowered from year to year.

2006 – It was time to end our journeying and come home. We'd brought a block of land whilst home on leave the year before but the building was some time from completion so we rented a

flat for 15 months or so. By this time we knew that Cymys just didn't do it for us – yes, we did retrieve some of our plants from the friend who'd been looking after them but they'd lost their name labels and whilst healthy neither of us were greatly inspired by them. So we let our friend keep the majority of the cymys and slowly bought a few phals – mostly unnamed varieties from Bunnings and flower shops. Lyn has become extremely good at growing Phals inside and some of those plants that we've now had for 5 or 6 years continue to flower faithfully each year. We've even won a number of Flower of Division monthly competitions with these unnamed orchids.

As I'm sure you all know building a new garden from scratch takes a lot of time and effort – especially when the land is steep and requires retaining walls, drainage, etc. It was not until two years ago (2011) that our new garden was at last at the stage where we could find both room and time for a small hot house.

Lyn was ecstatic when, for her birthday two years ago she received an envelope containing the order note for a brand new 2m x 3m bi-wall hot house. An immediate visit to Johnston



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Orchids was required to buy something to put into it when it was finally assembled. We built benches from push together parts and added under bench electric heating to one side (set to a minimum of 17 degrees).

A small fan keeps the air moving and an evaporative cooler helps to modify the heat in summer and raises humidity somewhat.

The first year with the new house was very much a learning curve – there was way too much light at the start. Our house is quite exposed and gets a lot of light from all sides – even phallys, that like a reasonable amount of light, developed yellowish streaks in their leaves quite quickly. So we added extra shade cloth both over the top and at the ends of the house and this stays in place all year – the light intensity during winter is still adequate. We have now also learned how to control temperature better during heatwaves (an all too common occurrence in these days of global warming) through frequent misting and we've placed large 400 litre containers full of water under the benches which helps to modify temperature fluctuations.

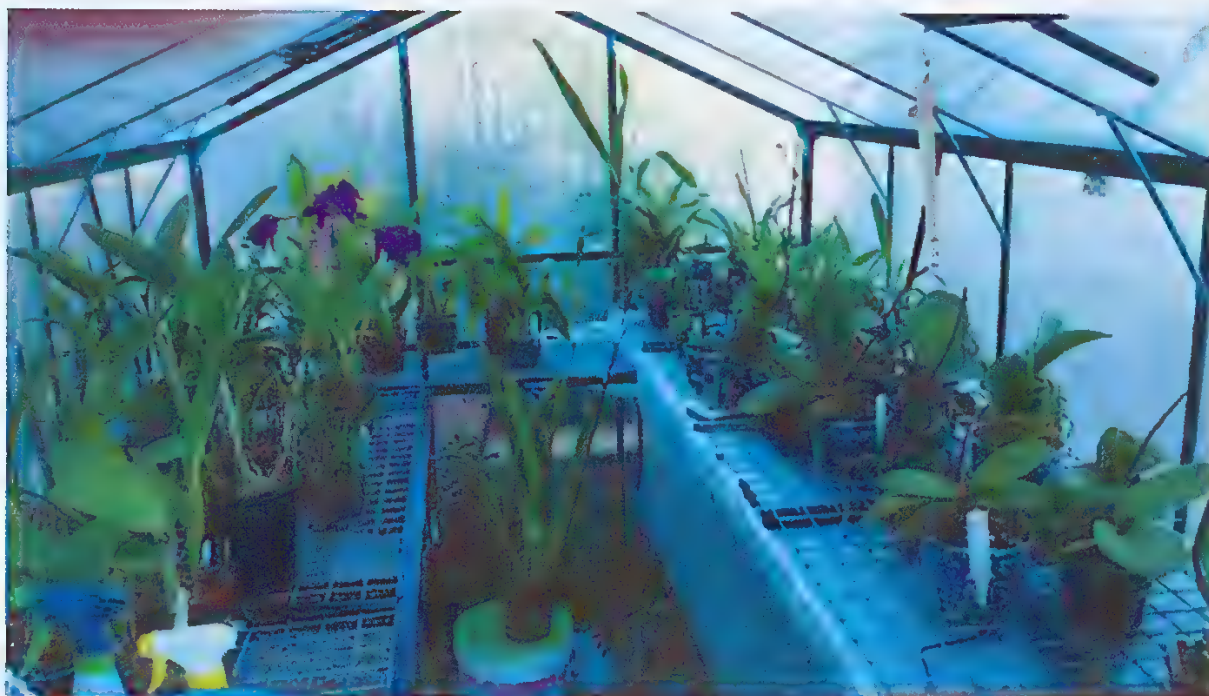
We finally both retired from full time work last year – we're both close to 70 – and, now that we have the time have once again rejoined OCSA. We've also subscribed to *Orchids Australia* as well as the International Phalaenopsis Association. OCSA is now much smaller than in its hey days of the early 90's but much friendlier and we've made many new

friends. We've learned that, although many are beautiful, our un-named orchids are a dead-end in terms of breeding and awards so we're now focussing on named cultivars and hope to do some of our own crossings in due course.

So life has come full circle – along with our growing collection of phallys and oncidiums, catts and dendrobies I finally have a couple of strap leaf vandas and an ascanda – two of the plants that I fell in love with when Andrée Millar introduced me to them in the Lae Botanical Gardens a little less than 50 years ago! All I need now is an *Arachnis* and a *Renanthera* and, and, and..... Orchid growers are never content are they?

Postscript: At the Royal Adelaide Show last September I was sitting talking to Russell Job, OCSA President and general orchid guru. He asked what it was that had first sparked my interest in orchids – and I related the story above about Andrée Millar and her influence. But right in front of us was a beautiful "Donkey orchid" – the wonderful Australian native terrestrial, *Diuris*. I then remembered that as a young lad, living in Hahndorf in the Adelaide Hills, I had collected native orchids in late spring each year and sold bunches of them on the roadside – the main road to Melbourne in those days. I vividly remember what we then called Spider orchids (*Arachnorchis* spp.), Donkey orchids (*Diuris* spp.), Monkshoods (*Pterostylis* spp.), Blue bonnets (*Thelymitra* spp.) and others from over 60 years ago. Russell sagely observed

that that was the true start of my love affair with the orchid – and I cannot but agree!



The new hot-house



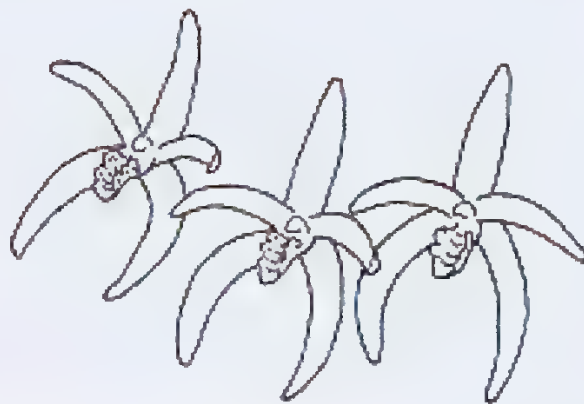
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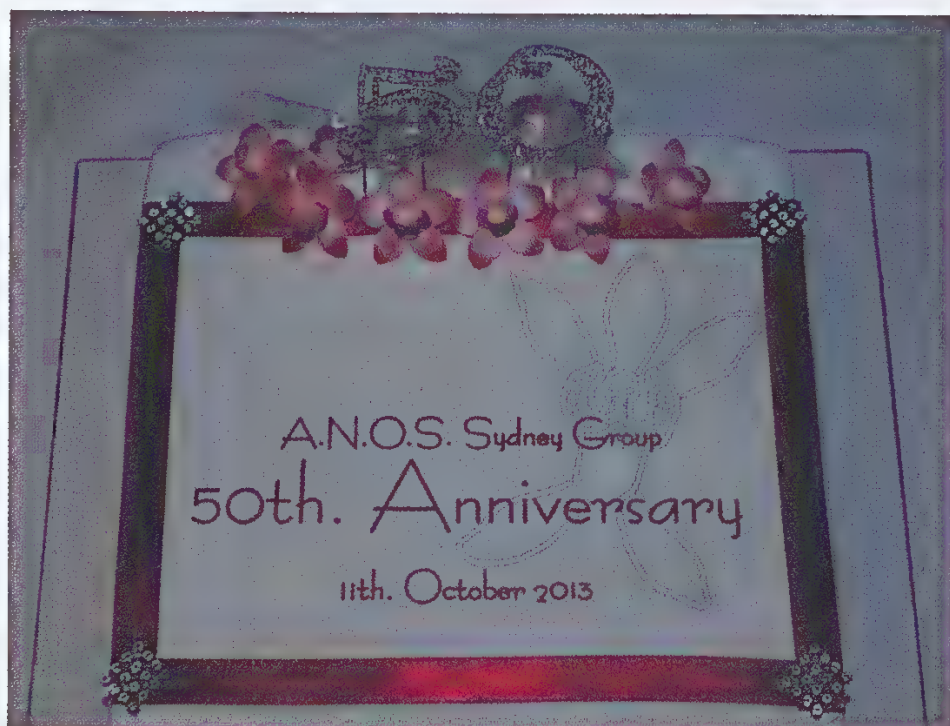
Andrew Locke, President ANOS Sydney Group



On Friday 11th October, 2013 ANOS Sydney Group celebrated its 50th Anniversary. It was quite good timing as this was 50 years to the day since the society was formed.

ANOS Sydney Group held its anniversary dinner at Fox Hills Golf Club and it was a wonderful venue to celebrate such an auspicious event. In attendance we had some very special attendees including our Patron (also life member) Michael Harrison, ANOS President Tony Clarke and ANOS Sydney life members David Titmuss, Karl Puhlmann and David Butler. Also in attendance were ANOS life

Life members of ANOS and Sydney Group cutting the celebration cake. From left, Michael Harrison, David Banks, David Titmuss, David Butler, Murray Corrigan and Karl Puhlmann (above). Top of the celebration cake (below).





members Murray Corrigan and David Banks along with their partners and / or guests.

Unfortunately we were missing life member Fred Sweetman from these photos who at the very last moment could not make it.

Michael Harrison spoke at the dinner about the history of the society and recalled events from years gone past. It was wonderful to see that 50 years on, there are still so many of us enthusiastic in growing Australian native orchids and active in various aspects of orchid conservation to ensure that our beautiful orchids can be enjoyed for many more years to come.

I would like to thank all committee members for their input and assistance with putting this event together. I would also like to thank all those who attended the event and helped celebrate. It was great to have everyone together and be able to share stories and memories about the society (and of course share our growing tips with each other).

Members of ANOS Sydney Group and guests of the society listening to the ceremonial speeches.

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Genera Orchidacearum Volume 6 and Australian Orchids

¹Peter B. Adams and ²Andre Schuiteman

¹School of Botany, University of Melbourne, Vic. 3010 and National Herbarium of Victoria, Birdwood Avenue, South Yarra, Victoria 3141; gallangowan@optusnet.com.au

²Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, UK; a.schuiteman@kew.org

Abstract

Genera Orchidacearum is an authoritative series of six volumes published from 2000 to 2014 which provides an international consensus taxonomic treatment, as well as biology and other aspects of all genera of orchids. Volume 6, published in February 2014, includes the major Australian genera *Dendrobium*, *Bulbophyllum*, *Sarcochilus* and their allied genera. *Dendrobium* is used broadly, with the use of sections to classify subgroups. *Dockrillia* is rejected, and is classified as Section *Rhizobium* within *Dendrobium*. *Cadetia*, *Diplocaulobium*, and *Flickingeria* also return to *Dendrobium*. All Australian bulbophyllums remain in *Bulbophyllum*, and *Sarcochilus*-allied genera remain unchanged in *Aeridinae*.

Classification and naming of Australian orchids will be much clearer and more stable with the publication of Volume 6 of *Genera Orchidacearum* (GO) in February 2014. This authoritative series of large books provides a taxonomic treatment by an international team of experts, and includes morphological and DNA studies as well as information on all orchid genera. The Latin title simply translates as The Genera of Orchids. The first volume of GO was published in 2000, and Volume 6 is the concluding volume. This is a significant volume for Australia as it deals with the major genera *Dendrobium* and *Bulbophyllum* as well as the *Aeridinae* (i.e. genera related to *Sarcochilus* and *Vanda*). A period of 25 years of instability will end, but there will always be some necessary changes as new information becomes available.

In the December 2010 *Orchadian* we foreshadowed this publication with respect to *Dendrobium*, explaining the 150 years of taxonomic approaches and how molecular (DNA) and cladistic technological advances contribute to decisions about genera. (If there is a technical term unfamiliar to you in this article you will almost certainly find it explained in the glossary at the end.)

This paper considers the GO series overall, its purposes, approaches, methods, relevance to orchid growing and the range of orchid activities, and also the taxonomic

recommendations for Australian epiphytic and lithophytic genera. New taxonomic treatments are ignored by some growers who think that a major replacement will not be far away. This did not occur with the earlier volumes and it will not with this one, due to the use of all available evidence, and the unlikelihood of new technologies such as molecular markers and other data overturning the general classification presented. The responsibility for both retention and rejection of genera is shared by the editors and individual experts. Ninety-seven authors have contributed to the series, 28 of them to Volume 6.

Approach and objectives of *Genera Orchidacearum*

The main aim of GO is to produce a 'more robust and natural account of the orchids at generic level and above, incorporate the results of new molecular data, and identify those disciplines and taxa needing additional work'. The same principles and methods used to classify other life forms are used, and a consistent approach is applied across all orchid genera. The GO treatments generally represent an international consensus view of the available evidence, which includes morphology, molecular data, distribution, ecology and pollination, with strict adherence to the principles of the former International Code of Botanical Nomenclature (ICBN), which was

recently replaced by the equivalent International Code of Nomenclature for Algae, Fungi, and Plants. One of the most important principles used is the stability of names unless there is sufficient objective evidence to require a change.

The four editors of GO (Alec Pridgeon, Phillip Cribb, Mark Chase and Finn Rasmussen) are distinguished orchid specialists, and other international specialists have contributed accounts of the genera by invitation. Each volume has taken several years to prepare. The series is an authoritative reference tool for scientists, institutions, orchid growers and breeders, collectors and registration bodies such as the Royal Horticultural Society (RHS).

The subfamilies, tribes, subtribes and genera of orchids are described with all their synonyms, and for each genus there are comprehensive descriptions, keys to related genera or sections, citation of type species, distributions with maps, ecology, pollen and pollination, anatomy, phytochemistry, cultivation, economic uses, taxonomic notes, etymology, and a select

bibliography of important reference works. The genera are all illustrated with line drawings and many have colour photographs as well.

The recommendations of GO offer a standardised and stable taxonomy which results in clearer communication, versus a plethora of individual approaches and taxonomic treatments. Most of the text is not excessively technical, and is generally understandable by orchid enthusiasts. For Australian orchids, including terrestrials (covered in Volumes 2–3), the approach is conservative with relatively minor changes. There are some genera that are not supported by available evidence, and those unfamiliar with the scientific data and origins of names may be surprised that they are no longer recommended. In many cases they will fall into disuse as synonyms.

In 2011 at the 20th World Orchid Conference in Singapore, several editors and authors of GO Volume 6 spoke on the evidence-based view for orchid genera (Elliot *et al.*, 2013). Alec Pridgeon (2013) spoke on 'What is a genus?', and defined it as 'a taxonomic category to which every



Dendrobium torresae, member of section Lichenastrum



Bulbophyllum newportii, Australian species classified in genus *Bulbophyllum* in GO 6

species must belong and a group of species more similar to each other than to other groups'. He emphasised the principles of Backlund and Bremer (1998) in establishing genera, using the guidelines of maximizing stability, phylogenetic information, support for monophyly and ease of identification. He also announced that GO would be conserving the long-held conventions for Australian genera, including *Dendrobium*, *Sarcochilus* and allies, and *Bulbophyllum*.

There is no universally accepted definition of ranks such as family, genera and species, and probably never will be, as the classificatory system is inherently artificial, attempting to fit nature and its variability and numerous levels of hierarchy into a fixed framework with a limited number of levels. It is generally accepted, however, that recognizable characters, or a number of them, are needed to circumscribe each rank. More recently, the cladist view, primarily using DNA results, is that lineages (clades, subclades) derived from a common ancestor should be used to delineate taxonomic

ranks, but any system that does not also refer to important morphology, distribution and other biological factors is unlikely to be accepted.

Distinguishing features of *Bulbophyllum*, *Dendrobium* and the Aseridinae

Keys to identify genera and sections use a character or combination of them that is consistent and will separate all members. This may be difficult for members of closely related genera, where almost all characters are shared. Orchid growers often ask what makes a *Dendrobium* or a *Bulbophyllum*. The flowers are very similar and may have essentially the same characters. *Bulbophyllum* is distinguished by inflorescences that arise from the base of the pseudobulb (stem) or from the rhizome. *Dendrobium* flowers arise from above the base of the stem, either laterally or apically. Australian bulbophyllums have a single leaf, but most African and some Asian species have two, or rarely three leaves. *Bulbophyllum* species are mainly fly-pollinated, whereas *Dendrobium* is pollinated predominantly by bees, wasps and birds. The keys in GO Vol. 6 are based on these

characters, and use what are consistent, trouble recognizing them at first glance. Dockrill recognisable differences to identify genera. noted, after using long detailed descriptions of

Likewise some sections of *Dendrobium*, such as *Dendrocoryne* and *Latouria*, are fairly closely related, or at least difficult to distinguish. The only differentiating features, when all species of these sections were considered, related to the details of the flowers, in particular the rostellum, flower texture and callus structure of the lip.

The subtribe Aeridinae is strongly represented in Australia, New Guinea and in Asia. All Australian genera have similar floral and vegetative structures, and are separated mainly on relatively obscure details of the labellar callus, pollinia, column-foot, lip mobility and rostellum, yet experienced growers have no

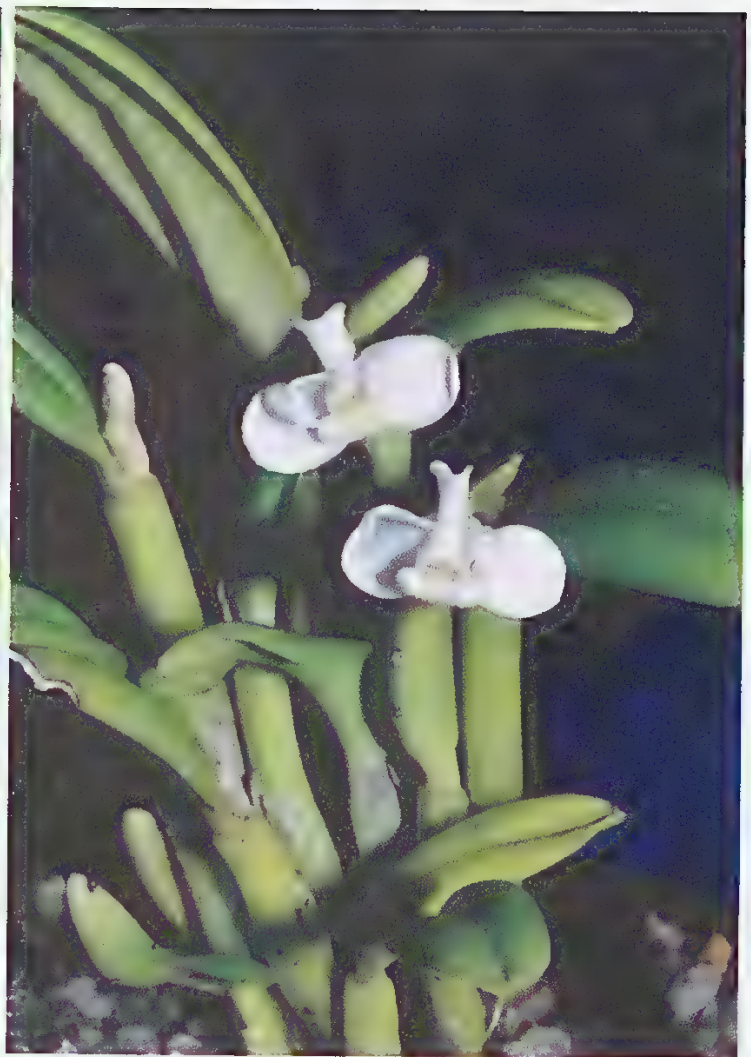
trouble recognizing them at first glance. Dockrill noted, after using long detailed descriptions of the genera, that 'separating some.... seems, superficially at least, to be of a rather trivial nature' (Dockrill 1992 Vol. 2 p. 591). *Sarcochilus* is the largest genus in Australia and has four pollinia in two closely appressed unequal pairs. The monotypic endemic genera *Mobilabium*, *Rhinerrhiza*, *Peristeranthus*, *Papillilabium* and *Schistostylus* have unique features and size differences.

Dendrobium

Australian *Dendrobium* taxonomy, including the most recent molecular contributions have been reviewed in Adams (2011) and Schuitemann and Adams (2010). The relationships within Dendrobiinae, where *Dendrobium* is the largest

Table 1. GO treatment of Australian and Australasian genera in Epidendroideae,DendrobieaeTribe

Sections of Genus <i>Dendrobium</i>	Sections of Genus <i>Bulbophyllum</i>
<i>Monophyllaea</i>	<i>Cirrhopetalum</i>
<i>Cadetia</i>	<i>Adelopetalum</i>
<i>Dendrocoryne</i>	<i>Polymeres</i>
<i>Diplocaulobium</i>	<i>Brachystachyae</i>
<i>Eleutheroglossum</i>	<i>Monanthaparva</i>
<i>Crinifera</i>	<i>Minutissima</i>
<i>Grastidium</i>	<i>Oxysepala</i>
<i>Latouria</i>	<i>Monanthes</i>
<i>Lichenastrum</i>	<i>Sestochilus</i>
<i>Macrocladium</i>	<i>Brachypus</i>
<i>Microphytanthe</i>	
<i>Biloba</i>	
<i>Phalaenanthe</i>	
<i>Rhizobium</i>	
<i>Spatulata</i>	
<i>Conostalix</i>	
<i>Brevisaccata</i>	
<i>Calyptrochilus</i>	
<i>Dendrobium</i>	



Dendrobium teretifolium var. *calamiforme*, section *Rhizobium* (top left); *Dendrobium taylori*, returned to *Dendrobium* from *Cadetia* in GO 6, in Section *Cadetia* (top right); *Dendrobium glabrum*. In GO 6 *Diplocaulobium glabrum* (below) is returned to *Dendrobium* as section *Diplocaulobium*.



genus, are complex and difficult to assess in any system of classification. In GO, *Dendrobium* is treated as a single large genus with sections to which the species can be allocated using a key. There are predominantly Asian sections and a group of Australasian ones. Most Australian species belong in the 17 Australasian sections. GO has taken a broad view of *Dendrobium* rather than splitting it into many genera. Proposals for splitting *Dendrobium* into many separate genera (Clements and Jones 2002) have not been accepted.

The DNA results (Schuiteman and Adams 2010; GO Vol. 6) show that currently used molecular markers do not produce clear, well supported lineages required for splitting *Dendrobium* into separate genera, and morphology often does not tally with groupings based on molecular results. *Dendrobium* is retained and the allied genera *Cadetia*, *Flickingeria* and *Diplocaulobium*, which in the past were part of *Dendrobium*, are again subsumed under *Dendrobium*, and will require further detailed studies to classify them further. Some names are likely to be retained for sections.

There is little that is new in using sections. Schlechter (1972-1925), who lived in New Guinea for a few years, described many new species, and critically reviewed the genus. He established 41 Sections in *Dendrobium* on the basis of morphological relationships. GO has fewer sections, in line with Schlechter's comments on problem groups that he felt would need further revision. Schlechter's sections were used by Dockrill (1969, 1992) and others (Lavarack, Harris and Stocker 2000; Wood 2006), and his monumental work remains a very useful text.

In the major Australian sections *Dendrocoryne*, *Spatulata* and *Phalaenanthus* no splitting proposals have gained acceptance. The use of *Dockrillia* for sect. *Rhizobium* has gained acceptance in a few circles within Australia, but was not adopted by the Royal Horticultural Society (RHS) and Royal Botanic Gardens, Kew. Brieger (1981) singled this section out without convincing evidence in a poorly argued classification that was promptly rejected by

such specialists as Gunnar Seidenfaden and Phillip Cribb. There is a superficial but erroneous impression that the vegetative features of sect. *Rhizobium* are distinctive and uniform. The group has non-resupinate flowers that otherwise closely resemble other dendrobiums. When this is examined more closely (Byrne-Dimos and Adams 2007), there are at least five morphological variants, with more than half of the species being terete-leaved, and the rest diverse, including the gherkin-shaped *D. cucumerinum*, dagger-like *D. pugioniforme*, tongue-like *D. linguiforme*, and others more difficult to classify. Molecular (DNA) results have provided no evidence to separate sect. *Rhizobium*. There are at least three sub clades within the section, all embedded within section *Dendrocoryne* (Burke *et al*, 2008), so they cannot be split off. Some growers will be disappointed that *Dockrillia* has been rejected as they have become familiar with using it, despite the absence of recognition by Kew and the RHS.

Bulbophyllum

Little has changed in the classification of *Bulbophyllum* species in Australia since Dockrill (1992) listed about 30 species in 12 sections, and all the species have been accepted as separate species except for *B. intermedium*. Jones (2006) proposed splitting the genus into nine genera encompassing 33 Australian species but this has not been accepted. There are several relatively recently described species e.g. *B. sladeanum*, *B. whitei*, which might not be acceptable to some taxonomists without further evaluation.

In the last 30 years only a few new Australian species have been described, mainly from North Queensland rainforests in sect. *Adelopetalum* (*B. boonjee* 1984), sect. *Oxysepalum* (*B. grandimisense*, *B. windsorensense*, and *B. lewisense*, all in 1989), sect. *Monanthaparva* (*B. wolfei* 1991), and sect. *Cirrhopetalum* (*B. gracillimum*) known from Asia and New Guinea for many years. The latter was found in North Queensland on the Tozer Range (Lavarack and Gray 1985).



Sarcochilus falcatus, type species for the genus. *Sarcochilus* is retained in GO 6

GO Volume 6 presents recent molecular (DNA) results. As in *Dendrobium*, it was found that treatment as a single large genus subdivided into sections best served the interests of nomenclatural stability and consistency. This treatment lays to rest repeated discussions about recognising *Cirrhopetalum* as a separate genus. DNA results clearly show that *Cirrhopetalum* is deeply embedded in *Bulbophyllum*, providing no evidence for a separate genus. Compared with Dockrill's treatment, the names and circumscription of many sections have changed. It is now considered that the Australian species belong in ten sections.

Aeridinae

The Australian genera of subtribe Aeridinae (formerly known as Sarcanthinae) have been very stable in their classification since Dockrill's 1967 treatment, which encompassed 21 genera. Most genera are small, consisting of a few species, with the exception of *Sarcochilus*, which has approximately 15 species (Upton 1992) or more (Jones 1988, 2006). The number of genera has remained at around 22 in all

treatments (Table 1) with a period when two or three species of *Sarcochilus* were reclassified as *Parasarcochilus* on the basis of a labellum with no conspicuous callus. The number of species and genera is slightly higher in Jones (2006), as a species from Christmas Island and Moa Island is included, and *S. moorei* was reclassified in *Rhinerrhizopsis*. This species from the northern part of Cape York has long been regarded as not belonging in *Sarcochilus*, and this has been confirmed by the molecular evidence presented in GO Vol.6. All of the Australian genera have clear specific identifying morphological characters supporting them, and five are monospecific and endemic to Australia. A sixth genus, *Plectorrhiza*, has two Australian mainland species and one endemic to Lord Howe Island. *Drymoanthus* has one species in Australia and one in New Zealand.

Phylogenetic studies by Alexander Kocyan, as outlined in GO, have demonstrated that all the (sub)endemic Australian genera of the Aeridinae, together with *Sarcochilus*, form a monophyletic group. Other non-endemic representatives of the Aeridinae in Australia,

Table 2. GO treatment of Australian and Australasian genera in Epidendroideae, Aeridiinae Group

Genera of Aeridinae	
<i>Chiloschista</i>	<i>Rhinerrhizopsis</i>
<i>Drymoanthus</i>	<i>Robiquetia</i>
<i>Luisia</i>	<i>Saccolabiopsis</i>
<i>Micropera</i>	<i>Sarcochilus</i>
<i>Mobilabium</i>	<i>Schoenorchis</i>
<i>Peristeranthus</i>	<i>Schistotylis</i>
<i>Papillilabium</i>	<i>Taeniophyllum</i>
<i>Phalaenopsis</i>	<i>Thrixspermum</i>
<i>Plectorrhiza</i>	<i>Trachoma</i>
<i>Pomatocalpa</i>	<i>Trichoglottis</i>
<i>Rhinerrhiza</i>	<i>Vanda</i>

such as *Phalaenopsis*, *Robiquetia*, *Saccolabiopsis* and *Vanda*, are not closely related to this clade. The Australian endemic genera, although small, are quite diverse in morphology compared to each other, and this is a major reason for retaining them at generic level. These non-endemic genera do not form a single clade, which suggests that they all colonised Australia independently from the north. They demonstrate that seemingly quite different



Saccolabiopsis armitii. A genus occurring in northern Australia, part of the Asian clade of Aeridinae with many species north of Australia

looking orchids can still be closely related. In a way, they seem to mirror on a small scale the evolution of the Aeridinae as a whole.

The GO classification has brought few changes to Australian Aeridinae; *Microtatorchis* has been merged with *Taeniophyllum* and *Trachoma* is provisionally recognised as distinct from *Tuberolabium*, which implies that the last mentioned does not occur in Australia. For genera outside Australia there are noteworthy changes including the merger of *Ascocentrum* and *Neofinetia* with *Vanda*; *Esmeralda* and *Armodorum* with *Arachnis*; *Ascoglossum* and *Porphyrodesme* with *Renanthera*; and *Malleola* with *Robiquetia*. The genus *Phalaenopsis* is expanded to include *Hygrochilus*, *Sedirea*, *Nothodoritis* and *Ornithochilus*. There may be some changes to the numerous small genera in Aeridinae as a result of future study.

Concluding Comments

The final volume of *Genera Orchidacearum* completes a total review of the orchid genera of the world, and contains important Australian groups. The international consensus published in this volume provides orchid growers with a stable nomenclature. The cost compared with earlier volumes has decreased considerably, making the purchase of a part or full set less prohibitive. Serious species orchid growers and societies could consider purchasing this landmark six volume full set as a valuable reference.

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Glossary

clade - a single branch of an evolutionary tree, a group with a common ancestor and all its descendants.

cladist - a scientist using cladistic methods, usually to determine relationships, and to classify.

cladistics - a method of classifying groups of organisms based on clades.

endemic - only occurring in a single area or country.

etymology - study of the origin of words or names.

heirarchy (classification) - grouping individuals into an ascending series of successively larger and broader categories.

ITS-DNA - internal transcribed spacer, one of the most useful DNA markers when investigating relationships of genera and species.

markers - indicators, in this sense a length of a particular piece of DNA sequenced and used to investigate relationships of species and genera.

monophyly - the condition that all taxa in a group arise from a single ancestor.

monotypic (monospecific) genus - a genus with only one species.

subclade - a part or subgroup of a clade that is itself a clade.

phylogenetics - the evolutionary history of a group of organisms, or the study thereof.

taxon (plural **taxa**)- a group or a member of a group in the taxonomic hierarchy, e.g. a species, genus, or family.



Plectorrhiza tridentata, member of a genus allied to *Sarcochilus* in the Australasian clade and retained in GO 6 on account of distinctive morphology.

Victorian Conservation Symposium

Alan Stephenson, (affine@tpg.com.au)

In late November 2013 a Conservation Symposium was held in Victoria. The two day event was sponsored by ANOS Victoria, Australian Orchid Foundation (AOF), Wimmera Catchment Management Authority, Victorian Department of Environment & Primary Industries (DEPI) and Ecology & Heritage Partners, an environmental consulting company. The Lake Fyans Holiday Park in The Grampians was the chosen site for the symposium and all events took place in the very well named Corella Café.

There were 20 papers presented over two days plus a *Prasophyllum* workshop and an insight into the Best of Brazil, wildlife and orchids by Gary Backhouse. Most of these were presented by either one or more scientists with a few simply by persons engaged in what I term, face-to-face or in your face (my terminology) conservation work.

The symposium began on Monday evening in a very relaxed manner with a BBQ and an easy way for all 86 registrants and organisers to assemble and get to know each other. The majority of presenters and registrants were from Victoria with three presenters from NSW, one from New Zealand, one from Tasmania and two from South Australia. The wide variety of attendees included two Victorian ANOS groups,

two consulting firms, Parks Victoria, several Victorian Universities, the Australian Plants Society, three representatives of various Field Naturalists groups, representatives of four different "Friends of" groups plus several teachers from a high school in Melbourne, which is the subject of a P.E.C.E. program. P.E.C.E. stands for propagation, education, conservation and exploration. This is the initiative of John Varigos, an ANOS Vic and AOF member who designed the program and has been able to implement it successfully in one school to date with the hope of more. The program enables students to be involved in all facets of orchids from flask, to pot and conservation including trips to orchid sites.

Most of the scientific papers were quite detailed and showed the in-depth study over long periods, which is necessary to formulate a full understanding of the dynamics of orchids including mycorrhizal fungi, pollinators, orchid food sources and the effects of fire. However, one common thread throughout many of these presentations was the regular references to orchid rainfall requirements. This is one area in which I have gained some insight through 12 years of monitoring and recording growth patterns in seven control plots of *Prasophyllum affine* and several others of *Corunastylis*



plumosa (*Genoplesium plumosum*). This requirement has also been a feature of the normal orchid year of 2013 where the vagaries of rain and the incidence of *in situ* orchid flowering, quality and quantity have been more impacted upon than in many previous years.

Some of the research studies undertaken have been over 10 years and these have been presided over by various dedicated scientific persons supported by groups of volunteers, known as "Friends of" the region in question, although many programs have been actively supported by members of ANOS Victoria and ANOS Geelong for many years. Some of this work is in and around the Melbourne metropolitan area but some projects require a 500 km round trip for the volunteers. It appears volunteers may be in greater need in the near future as another trend has appeared and that is the cessation of funding by a state government or agency and the willingness to privatise some agencies, which can lead to a loss of valuable scientific knowledge and input.

Such programs include *ex situ* collections and re-introductions of endangered orchids which also include seed storage via cryogenic means as this may be the only way to preserve some of our more rare species.

One presentation which was of great interest for me referred to orchid surveys, in particular for the current road building program to upgrade the Western Highway, where rare orchids and a moth are known to occur. Surveys

appear to be undertaken in a manner in contrast to many in my local area. This means actually on foot and not by vehicle and for those who doubt this occurs, I have ample documented evidence to prove this claim.

One of the very different presentations was by a Tasmanian couple who have purchased a conservation property and thrown themselves into an experiment to ascertain whether touching orchids can make them more prone to predation by animals. This was a more than interesting concept complete with initial trial and is sure to lead to further trials at a later date.

I found the two days to be most informative although the level of science presented, while necessary, was well beyond my level of understanding but I can recommend attendance and participation for any person remotely interested in orchid conservation. The variety of presentations provided something for everyone and is at the very least an excellent means of making contact with other interested and involved orchid people. Who knows if you may be able to help one of these people or if one of these people may be able to help you with a solution to your particular local environmental situation.



Views across Lake Fyams towards the Grampian ranges.

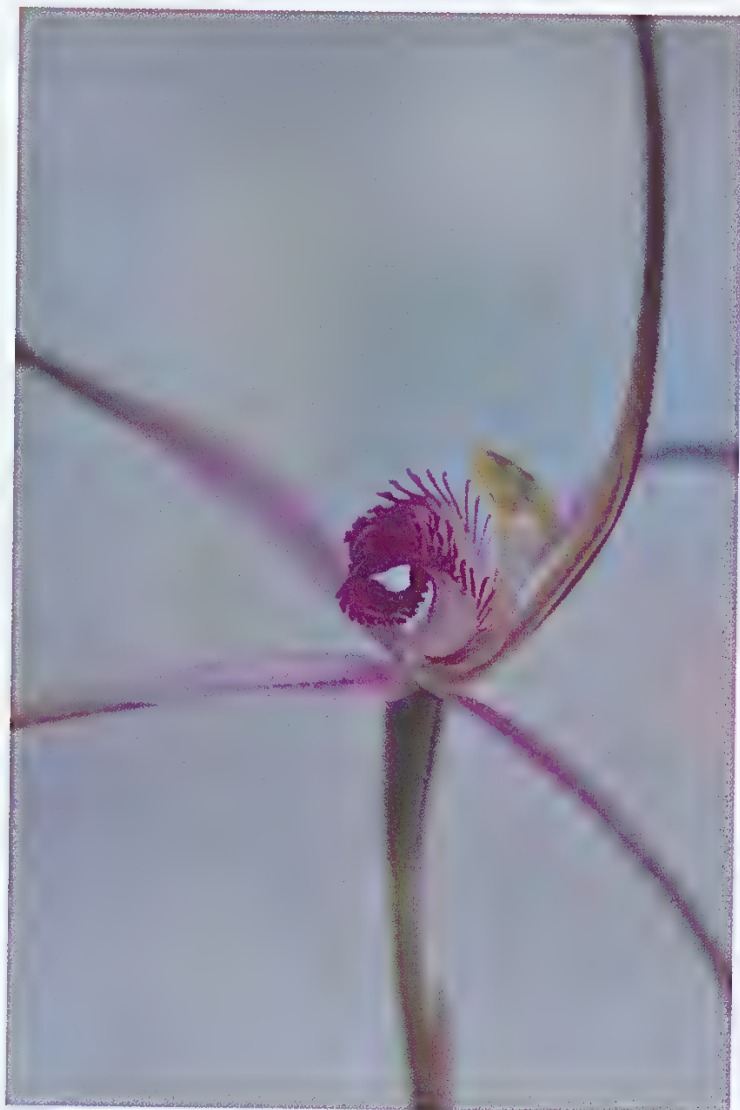
The Australian Network for Plant Conservation's Orchid Conservation Program

The Australian Network for Plant Conservation (ANPC) recently announced its new Orchid Conservation Program. The ANPC is a national not-for-profit organisation that aims to promote and improve plant conservation. For the past 22 years, the ANPC has been largely doing this by facilitating the exchange of information on best-practice plant conservation techniques through, for example, conferences, workshops, the quarterly bulletin *Australasian Plant Conservation*, and technical guidelines (including the Guidelines for the Translocation of Threatened Plants in Australia).

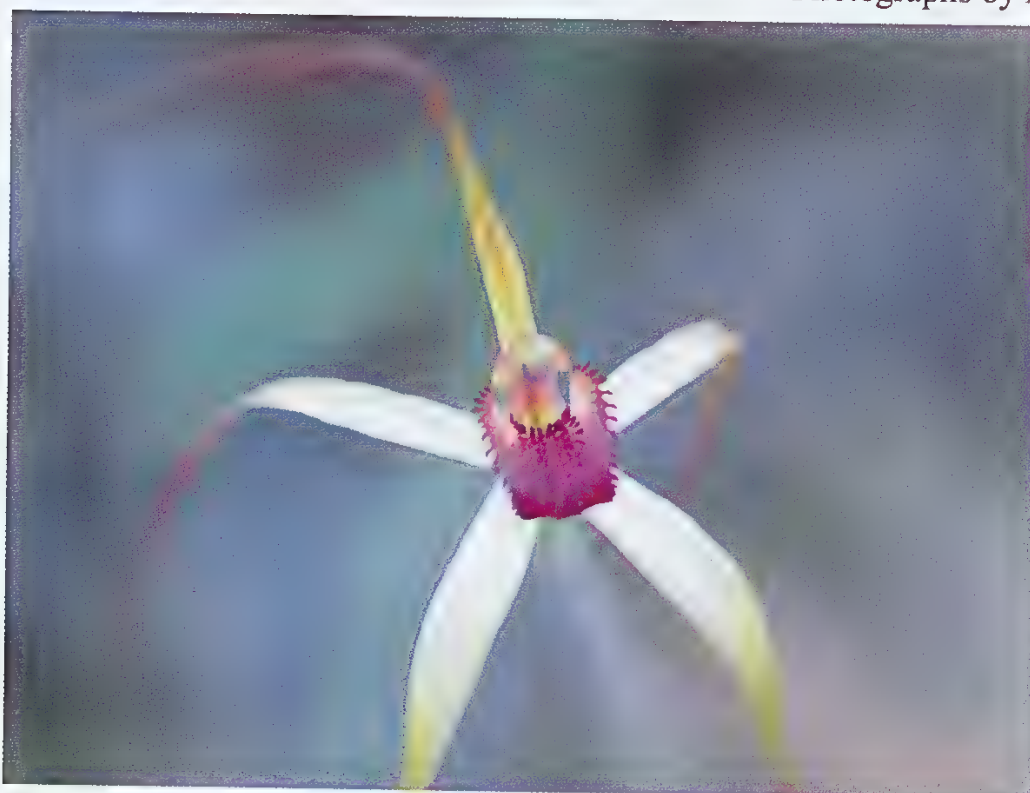
The Orchid Conservation Program is an exciting development for the ANPC as it provides an opportunity for the organisation to practice what it preaches and demonstrate best-practice plant conservation.

The Orchid Conservation Program focuses on the management, ex-situ propagation and reintroduction of threatened orchids, particularly across south eastern Australia.

The program has a long history and recently transitioned to the ANPC from Wimmera Catchment Management Authority (CMA) in Victoria. The ANPC is looking forward to working with Wimmera CMA and the many other



The Vulnerable *Caladenia versicolor* (above) and Endangered *C. fulva* (below) are among species being studied and managed. Photographs by Noushka Reiter.



organisations and community groups that have been involved in the implementation of this project to date.

The Program is led by Dr Noushka Reiter, who has over 14 years' experience in threatened flora management and has been with the Orchid Conservation Program for the past 7 years.

For more information visit www.anpc.asn.au

What's in a Name? *Brachypeza archytas*

Greg Steenbeeke

At a recent meeting of the ANOS Sydney Group I was asked by Mike Harrison was asked about the heritage of the name *Brachypeza archytas*. This species is one of the real oddities of ANOS, as it is one of the few orchids that occurs in an Australian territory that is not within the typical geographic delineation of the ANOS region. It comes from the small Indian Ocean territory of Christmas Island.

So what is the source of the name? The genus *Brachypeza* Garay comes from the Greek and means short foot. Leslie Garay, in establishing the genus, notes that the column-foot is characteristically short. The second (epithet) name was harder to source. Ridley described the species (as *Saccolabium Archytas*) in 1891. However, one clue is given by the way Garay writes the name in his 1972 paper. Historically, a proper name was also given capitalisation when used in the epithet. The use of a capital in *B. Archytas* suggests Ridley was referring to the Greek philosopher (a contemporary of Plato) of that name. He developed a mathematical / geometrical solution for finding a cube of half the volume of another by intersecting a cylinder or cone with a curve, making a shape not unlike that of the labellum and its side lobes.

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Pollination of the Small Duck Orchid, *Paracaleana minor*: Flower Structure and Function.

Colin C Bower, PO Box 300, Orange, NSW 2800 (colbower@bigpond.net.au)

Abstract

The peculiar duck-shaped flowers of the Small Flying Duck Orchid, *Paracaleana minor* (R.Br.) Blaxell, are oddities among orchids. The structure and function of *C. minor* flowers in pollination is described and illustrated by photographs. *C. minor* is pollinated by sexually deceived males of the Thynnid wasp, *Thynnoturneria armiger* Turner, on the Central Tablelands of NSW. Attracted males attempt to couple with the female-mimicking duck 'head', causing it to spring over, trapping them upside down against the column in the bowl of the duck 'body'. The labellum of *C. minor* mimics key aspects of the shape of a Thynnid female, including the female genitalia, that are critical for correctly orienting the male for successful pollination. The mechanism of the rapid labellum movement is described and illustrated.

Key words

Paracaleana minor, *Thynnoturneria armiger*, Orchidaceae, Diurideae, Drakaeinae, pollination, sexual deception, pseudocopulation.

Introduction

Orchids fascinate us with an extraordinary variety of colour and form, all built on the very simple template of a column, three petals and three sepals. Some 30,000 species have evolved by the astonishing diversification of these seven floral segments. The ventral petal, or labellum, is usually the most elaborately modified part, but all segments show extreme plasticity, far exceeding that of any other plant family. Some orchids are so bizarrely contorted as to be scarcely recognisable as flowers at all.

The often complex structures of orchid flowers are adaptations for attracting, guiding and manipulating pollinators. Generally, the more elaborate the flower, the more specialised is the pollination mechanism, and the more likely that the orchid species has evolved to exploit a particular insect or group of closely related insects. Accordingly, there is a close relationship between flower structure and function for pollination. In this paper I will explore the detailed structure and function of the peculiar duck-shaped flowers of the Small Duck Orchid, *Paracaleana minor* (R.Br.) Blaxell (Figure 1).

Structure

Small Duck Orchids have the following structural

features:

- Flowers are resupinate (reversed) with the column oriented downwards.
- A long column foot extends horizontally from the base of the inverted column.
- The sepals and lateral petals are reduced in size compared to the labellum and column which dominate the flower.
- The dorsal sepal and petals are attached at the base of the column, but the lateral sepals attach to the end of the column foot.
- Large wings extend outwards from the column and column foot forming a deep concave bowl, the duck 'body' (Figures 1 and 2).
- The duck 'neck', a broad, laterally concave, strap-like claw is bent into a C-shape and holds the labellum aloft from the end of the column foot.
- Shiny dark maroon to black warty glands cover the upper surface of the labellum (duck 'head') which is vaguely insect-like; broad at the base (the 'abdomen') before narrowing into a neck (the 'thorax') and expanding into a narrow bi-lobed head at the apex (Figure 3).



Figure 1. *Paracaleana major*

Previous studies

It is well known that if the tip of the labellum is gently pushed downwards in *Paracaleana* and the closely related Flying Duck Orchid, *Caleana major* R.Br., it will trigger the rapid rotation of the labellum into the column bowl. According to Rica Erickson (1965), it was Western Australian plant collector James Drummond who, in 1838, first reported the motion of the labellum in *Paracaleana nigrita* (J.Drumm. ex Lindl.) Blaxell. Erickson quotes Drummond as saying the labellum 'makes a prisoner of any small insect which the pouch will hold. When it catches an insect it remains shut while the insect continues to move about, but if the insect be not caught the box soon opens again.' The venerable RD Fitzgerald wrote at length in 1880 on the same phenomenon in *C. major*. He concluded that the flower functioned as a trap for insects, but was unable to ascertain the insects responsible for pollination.

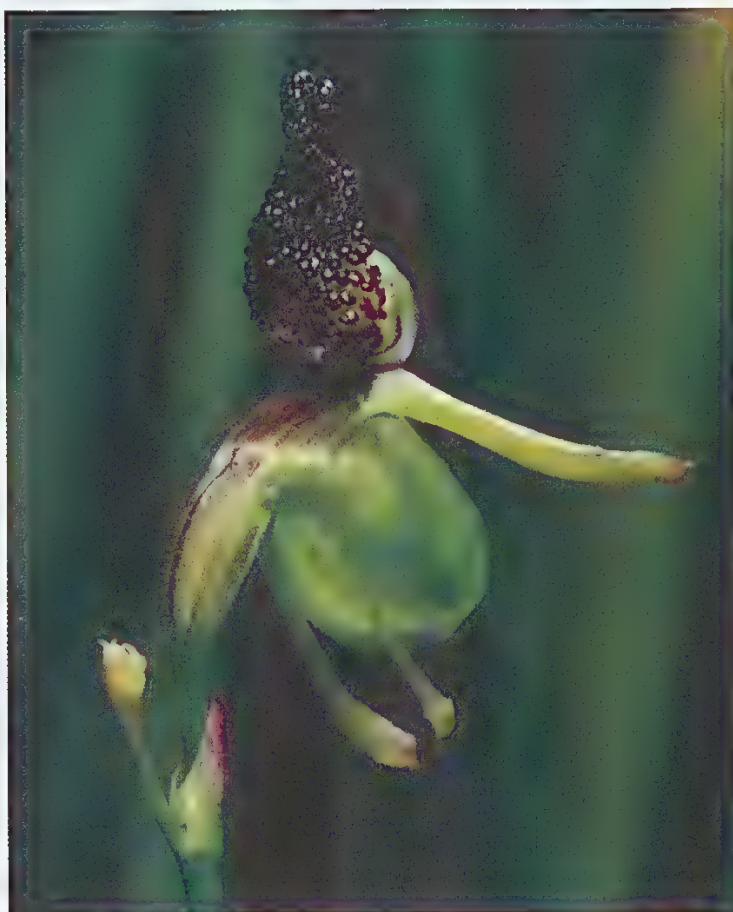
Cady (1965) made the first modern field observation of pollination in Duck Orchids at Narooma in NSW. He saw a male sawfly, *Lophyrotoma leachii* Kirby, land on the labellum



Figure 2. Column bowl of *C. minor* formed by column wings.

of *C. major* only to be instantly flipped violently into the column bowl and held there for a minute and a half until it could free itself. In the process, the orchid pollinia were attached to the

Figure 3. Insect-like labellum decoy of *P. minor*.



middle of insect's thorax. Bates (1989) made similar observations on *C. major* near Wauchope, NSW and published an excellent photograph of the event in *The Orchids of South Australia* (Bates and Weber, 1990) showing a sawfly identified as *Pterygophorus* sp.) 'jammed head first between the labellum and column' with only its abdomen and wings projecting beyond the labellum. Beardsell and Bernhardt (1982) and Bates (1989) suggested male sawflies may be attracted to *C. major* by sexual deception. However, the numbers observed are very low and there is no evidence of attempted pseudocopulation to support this conjecture.

Published observations of pollination in *Paracaleana* are also limited. Although *P. nigrita* is generally considered to be pollinated by sexually deceived males of a Thynnid wasp in the genus *Eirone* (misspelt as *Erione*) (Hoffman and Brown, 1992; Hopper and Brown, 2006), all reports are based on personal communications or personal observations without corroborating evidence. As part of a review of *Caleana* pollination (Bower, 2001a), the author summarised observations he made on *P. minor* using the pollinator-baiting technique (Stoutamire, 1983) at three locations in the

Bathurst-Orange area of NSW in 1988. Three attracted insects were identified by GR Brown as males of the Thynnid wasp, *Thynnoturneria armiger* Turner.

The author also photographed the interaction between *T. armiger* and translocated flowers of *P. minor* in the Mullion Range State Forest, approximately 15 km north east of Mullion Creek, NSW. These photos were the basis of the description of *P. minor* pollination published in Bower (2001a), but were lost in a house fire. In November 2013, the author rephotographed the pollination of *P. minor* at the same location. This paper provides a more detailed account of the pollination of *P. minor* illustrated by the new images.

Pseudocopulation in *C. minor*

Males of *T. armiger* fly upwind to *P. minor* bait flowers as if following an odour trail (Bower, 2001a). They alight directly on the labellum, grappling it with their forelegs around the narrow 'neck' (Figure 4). The male then arches his abdomen and probes with the terminal genitalia in an attempt to mate with the labellum (Figure 5 and front cover). The image on the Front Cover shows the expanded male



Figure 4. Male of *Thynnoturneria armiger* grappling the narrow thoracic region of the decoy with his forelegs.



Figure 5. *T. armiger* probing with his genitalia on the labellum of *P. minor*

genitalia clasping a small triangular process at the base of the labellum. This process is clearly visible in Figure 1 and most likely represents pseudo female genitalia and is termed here the pseudogenital process.

This behaviour is characteristic of Thynnid males when picking up their wingless females from ground cover vegetation. Prior to being picked up, females 'call' for males by emitting species specific sex pheromone odours to which males respond rapidly. A responding male will couple immediately with the female once he has grasped her behind the head, around her narrow neck-like thorax (Bower, 2001b). Coupling may occur at the point of pick up or after a short flight to nearby vegetation. The male then carries the female in copula to a flowering shrub or tree where he assists her to feed on nectar.

The pollination syndrome in *P. minor* is clearly based on the sexual deception of *T. armiger* males. The insect-like labellum is an elegantly crafted pseudo-female wasp. Critical structural features are:

- The length and colour of the decoy is likely to be similar to the real female.
- The 'abdominal' width of the decoy is greater than expected for Thynnid females. This may provide additional stimulus (supernormal stimulus) to attracted males.
- The presence of a pseudogenital process.
- The head region of the decoy is the correct size and shape to fit behind the male's head and between his forelegs into a cavity below the thorax which is adapted for carriage of females in flight. [Some male Thynnids have concave expanded forecoxae on their forelegs to cradle females]. This fit of the decoy's 'head' and 'thorax' to the male puts him into the correct position to couple with the pseudogenital process (front cover).
- It is likely that the warty glands on the labellum emit a faithful mimic of the sex pheromone odour used by female *T. armiger* to attract males for mating.

The above features ensure correct orientation

of the male for pollination of the orchid.

Trigger mechanism

The following account of the explosive mechanism of labellum closure is amended and expanded from Bower (2001a).

The strap-like labellum claw of *P. minor* has cable-like thickenings running down the sides of the thinner, broad, flexible lamina. In the resting position the lamina has a side to side concavity and the claw is curved upwards. Slight pressure on the labellum apex bends the strap outwards causing the concavity to suddenly pop out, or reverse, bending the claw rapidly downwards. This process was first described by Fitzgerald (1880).

Although labellum closure occurs in the blink of an eye, resetting is slow, taking 15 to 20 minutes (Bates, 1989; personal observations). Even when the labellum has returned to its upright position, it is insensitive to touch for some time.

The accompanying photographs were obtained by taking a flower that, unbeknown to the author, had not fully reset after closure, and using it to attract wasps. The result was that rather than closing abruptly when a wasp landed, the labellum closed quite slowly. This allowed different stages in the mechanism to be observed and photographed.

Triggering the labellum takes place in two stages (Bower, 2001a). Reversal of the claw begins at its outer end, where it joins the labellum, and proceeds rapidly to the basal end. Reversal in the outermost part of the claw tips the labellum under and closely parallel to the claw (Figure 6). When the concavity of the claw is half reversed, the body of the wasp is suspended horizontally upside down with its head in the column bowl (Figure 7). Finally, when the claw is fully reversed, the wasp is head up in the bowl with its wings pointing downwards (Figure 8). This double action ensures the tip of the labellum, and the wasp, clear the column apex.

Discussion

C. minor is an elegant example of the strikingly

close relationship between structure and function that occurs frequently in the most physically complex orchids. The *P. minor* labellum decoy is an excellent mimic of a flightless female Thynnid wasp, albeit exaggerated in width, most probably to maximise attractiveness to males.

The two key physical features of the decoy for orienting male *T. armiger* are the 'neck' which the male grasps with his forelegs and the pseudogenital process, with which the male attempts to couple. All other genera in the Drakaeinae, including *Chiloglottis*, *Drakaea*, *Spiculaea* and *Arthrochilus* have labellum decoys with analogous distinct head and neck regions for orientation of Thynnid males (Bower, 2001b). Several species in the genus *Caladenia* (Caladeniinae) that are pollinated by Thynnid wasps (Phillips *et al.* 2009) also have decoys with similar structures.

The mechanism of the labellum claw exhibits remarkable complexity with its elegant two stage movement. Rapid closure of the labellum appears to be a mechanical action brought on by the weight of the wasp overtipping the

labellum. By contrast, the slow resetting suggests that physiological processes re-establish the critical unstable equilibrium and provide the potential energy for the sudden mechanical discharge.

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Figure 6. Labellum of *P. minor* bent against the labellum claw.



Figure 7. Outer part of *P. minor* claw reversing concavity.

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Figure 8. Male *T. armiger* trapped between *P. minor* labellum and the column.



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Figure 1. *Sarcochilus hartmannii* 'Snowbert' (Photograph by Greg Steenbeeke)

The first two artificial *Sarcochilus* hybrids were *S. Fitzhart* and *S. Canary*, both registered in 1963. In 1972 there were only 12 registered hybrids in total and with the exception of one, all were made by Ira A. Butler, a pioneer in the hybridisation of *Sarcochilus* species. Of these 12 hybrids, nine had *S. hartmannii* (Fig. 1) as one parent. Even by 1991, there were only 57 registered *Sarcochilus* hybrids but this increased to 331 by the end of 2010 (ANOS 2010), a five times increase in the last 20 years. This indicates an on-going increase in the popularity of *Sarcochilus* hybrids amongst orchid breeders, orchid growers and the general public. The latter is evident in the well-attended annual Sarcanthinae shows around the country.

It is well recognized to orchid growers that many of the well known and awarded hybrids have *S. hartmannii* in their parentage but the extent of its influence on *Sarcochilus* hybridisation has not been documented. This paper reviews the current influence of *S.*

hartmannii in the hybridisation within the genus *Sarcochilus* and in the light of the finding, discusses the direction of future breeding.

Involvement in *Sarcochilus* hybridisation

The important influence of *S. hartmannii* is clearly evident when the parentage of current hybrids is examined (ANOS 2010). Of the total 331 *Sarcochilus* hybrids listed, *S. hartmannii* is involved in the parentage of 300 of them, i.e. 91 per cent. This compares to 80%, 32% and 32% respectively for *S. fitzgeraldii*, *S. falcatus* and *S. ceciliae*. The high percentage of *S. fitzgeraldii* is mainly due to the popular use of *S. Fitzhart*, by the breeders in their hybridisation work. A primary hybrid of *S. hartmannii* and *S. fitzgeraldii*, it is present in 52% of registrations.

Sarcochilus hybrids involving *S. hartmannii* can be categorised as:

1. Primary hybrids

S. hartmannii is a parent of many primary hybrids. There are more primary *Sarcochilus* hybrids with *S. hartmannii* as one parent than any other species within the genus. Many of these were among the earliest *Sarcochilus* hybrids registered but are still very popular amongst growers and continue winning prizes in shows, such as *S. Fitzhart* (1963) and *S. Melba* (1966).

2. Classical hybrids

As the most prominent member of the "Big Three" (*S. hartmannii*, *S. fitzgeraldii* and *S. falcatus*), *S. hartmannii* has been involved in the creation of many so called classical hybrids. These hybrids characteristically have large, round and filled-in flowers with mainly white and red coloration. They have been and are expected to continue to be favourites in shows. As indicated in Table 1, these hybrids, as distinct from those with parentage from other *Sarcochilus* species, have been frequent winners of quality awards from Australian Orchid Council (AOC). Out of the 53 quality awards given to the *Sarcochilus* hybrids between 1982 and 2012, 39 (i.e. 74%) were won by these classical hybrids.

Amongst the classical hybrids, the most well-known is perhaps *S. Burgundy on Ice* (Fig. 2), winner of FCC/AOC on two occasions (2009 and 2011). Its parentage is:



3. Novelty *Sarcochilus* hybrids

These refer to hybrids resulting from crossing of the smaller epiphytic (twig) *Sarcochilus* species, i.e. those members in groups 2 and 3 in Upton’s classification (Upton 1992), with the “Big Three”. Many of these species have different colours and shapes of flowers and so the hybrids often have novelty colours and/or shapes when compared to the classical hybrids.

This type of breeding has resulted in the making of yellow *Sarcochilus* hybrids. One well known example is *S. Misty* (Fig. 3). It is the progeny from crossing between two primary hybrids, *S. Aussie Dawn* and *S. Riverdene*. *S. Aussie Dawn* is a primary hybrid between *S. hartmannii* and *S. dilatatus* whereas *S. Riverdene* is another primary hybrid involving *S. hartmannii* and another twig *Sarcochilus* species, *S. hirticalcar*.

S. hartmannii x *S. dilatatus* → *S. Aussie Dawn*

S. hartmannii x *S. hirticalcar* → *S. Riverdene*

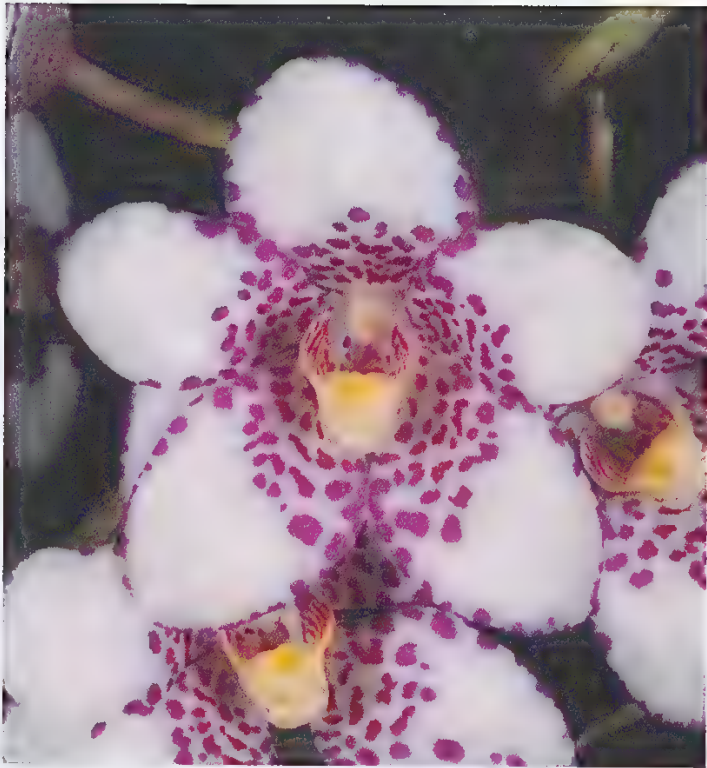


Figure 2. *Sarcochilus* Burgundy on Ice ‘Vo Vo’ (Photograph by Jorn Villiens)

S. Aussie Dawn X *S. Riverdene* → *S. Misty*

Use of both *S. dilatatus* and *S. hirticalcar* is responsible for the unfading yellow coloration and repeated use of *S. hartmannii* gave the improved shape found in *S. Misty* (Butler, 2008). Further improvements in shape, in terms of a flatter and more filled-in flat shape can be found in *S. Galaxy*, progeny of a cross between *S. Misty* and *S. hartmannii*.

Another way of producing yellow *Sarcochilus* hybrids involved the use of a special clone of *S. hartmannii* (Roper 2009). Firstly, he crossed *S. hartmannii* ‘Red Snow’ with *S. Cherie* (to make

Table 1. The top six most awarded* *Sarcochilus* hybrids by AOC (1982-2012)

Hybrids	No. of awards	Parentage	% <i>S. hartmannii</i>
<i>S. Burgundy on Ice</i>	19	<i>S. Judith</i> x <i>S. Fitzhart</i>	50
<i>S. Melba</i>	10	<i>S. hartmannii</i> x <i>S. falcatus</i>	50
<i>S. Magic</i>	10	<i>S. Duno Nickys Twin</i> x <i>S. Zoe</i>	50
<i>S. Fitzhart</i>	5	<i>S. hartmannii</i> x <i>S. fitzgeraldii</i>	50
<i>S. George Colthup</i>	5	<i>S. Melba</i> x <i>S. hartmannii</i>	75
<i>S. Bessie</i>	4	<i>S. George Colthup</i> x <i>S. Velvet</i>	62.5

*This refers to quality awards of HCC, AM and FCC

Table 2. *Sarcochilus* hybrids awarded* by ANOS (1989-2012)

Hybrids	Award (year)	Parentage	% <i>S. hartmannii</i>
<i>S. Jewell</i> 'Dungog'	HCC (1990)	<i>S. fitzgeraldii</i> x <i>S. Weinhart</i>	25
<i>S. Weinhart</i> 'Lonesome'	HCC (1995)	<i>S. weinthalii</i> x <i>S. hartmannii</i>	50
<i>S. Kelunji</i> 'First Up'	HCC (1996)	<i>S. Melba</i> x <i>S. Mavis</i>	50
<i>S. Tigersun</i> 'Brutus'	HCC (1996)	<i>S. Tigress</i> x <i>S. Fitzhart</i>	50
<i>S. First Light</i> 'Dawn'	HCC (1997)	<i>S. Aussie Dawn</i> x <i>S. hartmannii</i>	75
<i>S. Carnival</i> 'Red Velvet'	HCC (1997)	<i>S. Perky</i> x <i>S. Fitzhart</i>	50
<i>S. Duno Nickys Twin</i> 'Voodoo'	HCC (2003)	<i>S. Nicky</i> x <i>S. Fitzhart</i>	50
<i>S. Bungundy on Ice</i> 'Classic'	AM (2011)	<i>S. Judith</i> x <i>S. Fitzhart</i>	50
<i>S. George Colthup</i> '2000'	AM (2012)	<i>S. Melba</i> x <i>S. hartmannii</i>	75

*This refers to quality awards of HCC, AM and FCC

S. Cherie Snow) as well as with *S. Cherie Snow* (to make *S. Snowhart*). For both crosses, albinistic clones with yellow centres were produced and these were then selected. Crossing these albinistic clones of *S. Snowhart* with *S. Cherie Snow* made *S. Roberta*, a novel yellow hybrid (Fig. 4).

Many of the novelty hybrids flower much earlier in the year than *S. hartmannii* which usually blooms in October in Sydney. Therefore, creation of these types of hybrids has brought forward the flowering time as well as prolonged the flowering period of *Sarcochilus* orchids. Nowadays, it is not unusual to see *Sarcochilus* hybrids in bloom in late summer/early autumn (February/March in Sydney).



Figure 3. *Sarcochilus* Misty (Photograph by David Butler)

Dominance of *S. hartmannii* in *Sarcochilus* hybridisation - good or bad thing?

Records show that there is a total of 9 quality awards (HCC and better) conferred to *Sarcochilus* hybrids by ANOS between 1989 and 2012 (Table 2). All awardees have *S. hartmannii* in their parentage, ranging from 25% to 75 %. Similarly, even though many more quality awards have been conferred to *Sarcochilus* hybrids by Australian Orchid Council (AOC), the dominant influence of *S. hartmannii* is also evident. Between 1979 and 2012, of the total 102 quality awards (HCC and better) conferred by AOC to *Sarcochilus* hybrids, all had *S. hartmannii* in their parentage. Therefore, so far, no hybrid without *S. hartmannii* parentage has ever been awarded by ANOS and AOC.

Table 1 lists historically the six most awarded *Sarcochilus* hybrids by AOC (AOC 2012). They are ranked in the order of *S. Burgundy on Ice* > *S. Melba* > *S. Magic* > *S. Fitzhart* > *S. George Colthup* > *S. Bessie*. All these had *S. hartmannii* parentage ranging from 50 % to 75 %. This once again indicates the dominance of current *Sarcochilus* hybrids by *S. hartmannii*.

The future

Undoubtedly *S. hartmannii* has had a major influence on *Sarcochilus* hybridisation. Today,

anyone going to a *Sarcochilus* show or other orchid shows with *Sarcochilus* hybrids in display must be impressed by the display of beautiful orchids with a wide range of colours, white, red, yellow with different patterns (Allen-Ikeson 2011) but all with round filled-in *S. hartmannii* shape. The first objective that Ira Butler set for himself when embarking on his pioneering hybridisation program of *Sarcochilus*, namely "to produce plants similar to the large flowering types with flowers of different colours" (Upton 1992), has certainly been largely achieved.

This year, 2013, 50 years on since the first two *Sarcochilus* hybrids were registered, it is timely to re-assess if this apparent limitation of *Sarcochilus* hybrids to a round filled-in shape is desirable and should continue. There are a total of 18 species within the genus of *Sarcochilus* in Australia with a range of plant habit, shape, colour and size of flowers as well as time of flowering (Jones 2006). There is the open shape of *S. fitzgeraldii* and the 'X' shape of a few of the epiphytes, like *S. dilatatus*, *S. spathulatus* and *S. olivaceus*. The importance of preserving the diversity found amongst the different species within the genus in the hybrids produced has been pointed out by Upton (1992) and Woolf (2010). There is scope to retain the shape of some of the epiphytic *Sarcochilus* species in the hybrids. Breeding with other members within Sarcanthinae members may result in starry shape e.g. *Rhinochilus* Dorothy (*S. hartmannii* x *Rhinerrhiza divitiflora*) and *Rhinochilus* Rona (*S. fitzgeraldii* x *Rhinerrhiza divitiflora*). To facilitate this happening, some appropriate changes in the criteria of class division for *Sarcochilus* hybrids in Show Judging may be necessary. *Sarcochilus* hybrids can be judged separately according to shape. It is prudent to point out that this practice is fairly common in the judging of other orchid genera, e.g. *Paphiopedilum* and *Oncidium* Alliance. For example in *Paphiopedilum*, hybrids of Complex type (with large round filled-in flowers) are placed and judged separately from the Novelty type. For the sake of preserving diversity amongst *Sarcochilus* hybrids, in addition to colour, shape and other floral quality parameters also need to be considered in future breeding programs.



Figure 4. *Sarcochilus* Roberta
'favourite' (Photograph by Jorn Villiens)

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Species Awarded by ANOS in 2013

Ray Clement, National Registrar of Judges.

During 2013 four stunning species were granted awards by the ANOS Judges.

On 12th September, *Dendrobium schoeninum* 'Josh' grown by Neville Lee was granted a Highly Commended Certificate. Two days later on the 14th September, *Dendrobium striolatum* 'Neville' was granted a HCC award and an Award of Cultural Commendation. This plant was grown by Henk van den Berg.

A month later, on the 19th October, *Sarcochilus falcatus* 'Big White #1' grown by David Butler was granted an HCC. On 14th November, *Dendrobium tangerinum* 'Blackalls' was granted an Award of Merit. That plant was grown by Fred Fear.

More details are available on the ANOS website <http://www.anos.org.au/>.

Photographs by Bill Dobson.



Dendrobium schoeninum 'Josh' (above, left and right)

Sarcochilus falcatus 'Big White #1' (lower right)

Dendrobium striolatum 'Neville' (below)



Dendrobium striolatum
'Neville'



Sarcochilus falcatus
'Big White #1'



Dendrobium
tangerinum
'Blackalls'

(See also rear
cover)

Dendrobium wantiense (Sect. *Diplocaulobium*), a new species from Papua New Guinea.

Paul Ormerod, P.O. Box 8210, Cairns 4870, Queensland. Email: wsandave1@bigpond.com

Abstract. *Dendrobium wantiense* (Sect. *Diplocaulobium*) is described from West Sepik (now Sandaun) Province, Papua New Guinea.

This article is peer reviewed. Submitted 1/1/2014, revised edition received 1/2/2014.

The genus *Dendrobium* Swartz [including *Cadetia* Gaud., *Diplocaulobium* (Rchb.f.) Krzl, *Dockrillia* Brieger, and *Flickingeria* A.D. Hawkes] currently has about 580 species in New Guinea when treated in the broad sense. Only *Bulbophyllum* Thouars (c. 630 species) has more Papuan species but it can be expected that further studies of ephemeral-flowered taxa in the sections *Grastidium* Blume and *Diplocaulobium* Rchb.f. will reveal several more new entities.

Section *Diplocaulobium* (including section *Goniobulbon* Schltr.) has about 100 species distributed from Peninsular Malaysia to Samoa, of which about 70 occur in New Guinea. The section is characterised by its clustered, single-noded pseudobulbs topped by only one leaf, and ephemeral flowers in abbreviated pseudoterminal inflorescences. The plants often exhibit mass local flowering, similar to that seen in *D. crumenatum* Sw.

Dendrobium wantiense Ormerod, *sp. nov.*

Type: Papua New Guinea, Sandaun (West Sepik) Prov., Aitape Subdistrict, near Wantipi Village (on Blim River), 200 m, 28 July 1961, P.J. Darbyshire & R.D. Hoogland 8312 (Holotype: A!).

Closely related to *D. isthmiferum* J.J. Sm. but the flowers with an obovate-elliptic (vs. rhombic) hypochile, a clawed (vs. sessile) epichile, and straight, close (vs. undulate, wide apart) keels.

Epiphytic herb. Roots terete, c. 1 mm thick. Pseudobulbs caespitose, with an obliquely swollen base enclosed by a number of fibrous, brown sheaths, then with a long terete portion above, finally with the apex shortly dilated, drying yellow, unifoliate, 27.5-31.0 cm long (including 5 cm long swollen part), basal part 0.5

-0.7 cm thick, rest 0.20-0.35 cm thick, apex 0.90-1.05 cm wide. Leaf oblong, acute, base conduplicate, 12.1-13.0 cm long, 2.9-3.2 cm wide. Inflorescence pseudoterminal, 2-3 flowered; peduncles slender, c. 4 cm long. Flowers "wine red" (probably their post anthesis colour, in prime anthesis probably white). Pedicel with ovary terete, c. 25 mm long. Dorsal sepal linear-lanceolate, acute, 5-veined, c. 23.5 mm long, base 4 mm wide. Lateral sepals obliquely linear-lanceolate, subacute, 5-veined, c. 23.2 mm long, 6.4 mm wide basally, forming with the column foot a broadly conical, obtuse, c. 5.5 mm long mentum. Petals linear-lanceolate, acute, 4-veined, 21 mm long, 1.5 mm wide basally. Labellum trilobed, c. 12.8-12.9 mm long, 4 mm wide; hypochile obovate-elliptic, apex with or without a triangular sidelobe, c. 6 mm long, 4 mm wide; mesochile with either an undulate side or a flat side, 2 mm long; epichile peltate, acute, 4.8-4.9 mm long, 6 mm wide; callus of 2 carinae that are highest on the hypochile and thence merged into a linear-lanceolate ridge on the mesochile and epichile, glabrous but possibly minutely puberulent on upper third. Column obliquely conical, truncate, c. 2.1 mm long; column foot c. 5 mm long.

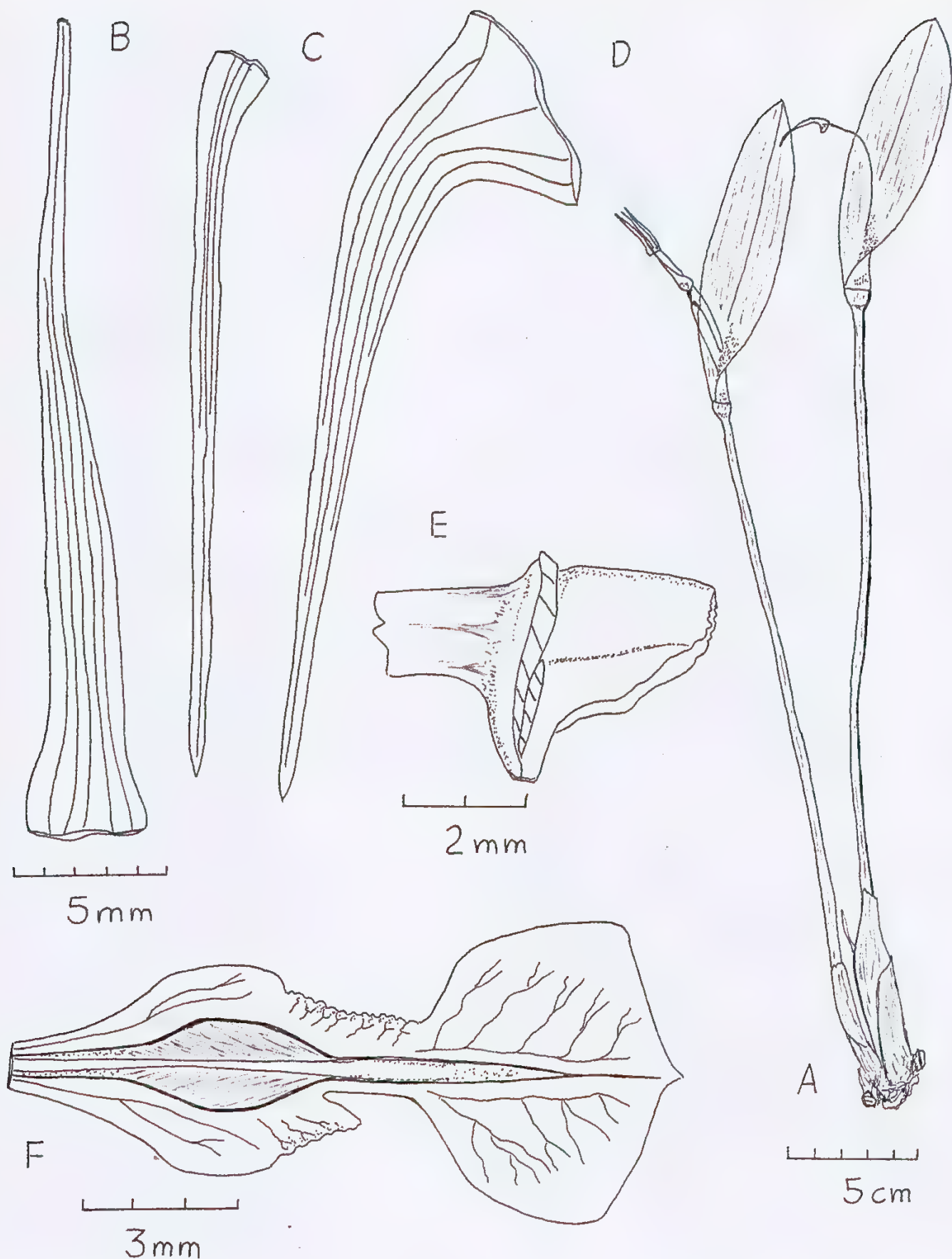
Distribution: Papua New Guinea.

Habitat: Uppermost branches of a tall tree (in lowland forest?), 200 m.

Etymology: Named after Wantipi Village near the type locality.

Vernacular name: Tallawalla (Orne Language, Wantipi).

This species is probably most closely related to *D. isthmiferum* J.J. Sm., sharing with it a similar habit and spidery flowers, it however differs in the shape of its labellum hypochile, in having a



Dendrobium wantiense—A. plant; B. dorsal sepal; C. petal; D. lateral sepal; E. column; F. labellum. A, B C D, E and F drawn to respective scales.

clawed midlobe that is peltate (vs. transversely rectangular), and straight, close keels on the developed labellum. Further collections are hypochile.

needed to determine if this is a regular character or just an aberrant development.

Acknowledgements.

I wish to thank herbarium and library staff at the Harvard University Herbaria (A, AMES, GH) for their help and hospitality during my visits.

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Shows - Events - Advices

All dates 2014 unless noted—States are colour coded: QLD, NSW, VIC

ANOS Newcastle Autumn Show

Sat 3rd / Sun 4th May
Wallsend Nursery
Lake Road, Elmore Vale

Tinonee Nursery Open Day and Show

Sunday 6th July
Tinonee Orchid Nursery
786 Tinonee Road
Tinonee near Taree

ANOS Central Coast Spring Show

Friday—Sunday, 22-24th August
Narara Valley Nursery
2 Manns Road, Narara

ANOS KABI Spring Show

Saturday—Sunday, 23-24th August
Bald Hills State School
2156 Gympie Rd, Bald Hills

ANOS Newcastle Spring Show

Saturday—Sunday 30-31st August
Gateshead Bowling Club
Lake Street Windale

ANOS Mid North Coast Show

Includes the Speciosum Spectacular
Saturday—Sunday 6-7th September
57 Spooners Avenue
Greenhill via Kempsey

ANOS Sydney Spring Show

Saturday—Sunday 13-14th September
Pandorea Room
Eden Gardens Nursery
301-307 Lane Cove Road, North Ryde

ANOS Warringah Spring Show

Saturday—Sunday 13-14th September
Forestville Memorial Hall
Starkey Street, Forestville

ANOS Illawarra Spring Show

Saturday—Sunday 13-14th September
Old Court House
Cliff Road, Wollongong

ANOS Macarthur Spring Show

Saturday 20th September
Narellan Town Centre (outside Coles)
Camden Valley Way, Narellan

ANOS Melbourne Suburbs Group Spring Show

Saturday 4th October
Lilydale Lake Community Room
435 Swanvale Road, Lilydale

ANOS Central Coast Sarcophilus Show

Saturday—Sunday 11th-12th October
Penrose nursery and Aquarium
224 The Entrance Road (cnr. Penrose St), Erina

ANOS Newcastle Sarcophilus Show

Saturday—Sunday 18-19th October
The Adamstown Club
282 Brunker Road, Adamstown

ANOS Illawarra Sarcophilus Show

Saturday—Sunday 18-19th October
Old Court House
Cliff Road, Wollongong

ANOS Sydney Sarcophilus Show

Saturday 18th October
Community Church
41-43 Eaton Road, Pennant Hills

ANOS Macarthur Late Spring Show

Saturday 25th October
Narellan Town Centre (outside Coles)
Camden Valley Way, Narellan

ANOS Melbourne Suburbs Gp Late Spring Show

Saturday 25th October
Montrose Primary School
Leith Road, Montrose

DIRECTORY OF A.N.O.S. GROUPS (and Associated Societies)

NEW SOUTH WALES

- **ANOS Central Coast:** PO Box 3010, Erina NSW 2250 - (02) 4343 1809
2nd Wednesday each month, 8pm. Narara Community Centre, 2 Pandala Rd, Narara 2250
- **ANOS Far North Coast Inc:** PO Box 949, Ballina NSW 2478 - (02) 6686 6303
3rd Saturday each month (except December), 2pm. C.W.A. Room, River Street, Ballina.
- **ANOS Illawarra:** 2 Wilford St, Corrimal NSW 2518 - (02) 4284 8308
2nd Tuesday each month, 7pm. Old Court House, Wollongong.
- **ANOS Macarthur and District:** 43 Strickland Cres, Ashcroft NSW 2168 - (02) 4681 8589
3rd Thursday each month, 8pm. Birriwa Community Hall, Fitzpatrick Rd, Mt Annan.
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Last Sunday each month, 12 noon, followed by BBQ. Contact secretary for location—Taree or Wauchope.
- **ANOS Newcastle:** PO Box 4021, Rathmines NSW 2283 - (02) 4975 3729.
4th Thursday each month, 7.30pm. John Young Community Hall, Thomas St, Cardiff.
- **ANOS Sydney Inc.:** 22 Rabaul Ave, Whalan NSW 2770 - (02) 8824 6338.
3rd Friday each month, 8pm. Senior Citizens Hall, B.H. Community Centre, Conie Ave, Baulkham Hills
- **ANOS Warringah Inc.:** PO Box 421, Forestville NSW 2087 - (02) 9981 2525
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- **ANOS New Zealand Native Orchid Group:** 42 Titiro Moanna Rd, Korokoro, Lower Hutt 5012

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1st Thursday each month, 7.30pm. Showground Hall, James St, Beenleigh.
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2nd Tuesday all months except January, 7.30pm. Bald Hills Memorial Hall, 2126 Gympie Rd, Bald Hills.
- **ANOS Mackay and District Inc.:** PO Box 138, Koumala QLD 4738 - (07) 4950 1065
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- **ANOS Townsville Inc.:** 92 Curie St, Wulguru QLD 4811 - (07) 4778 4311
1st Tuesday each month (except January), 8pm. Townsville Orchid Society Hall, Joe Kirwan Park, cnr Bamford Lane and Charles St, Townsville.
- **Native Orchid Society of Toowoomba Inc.:** 106 Umbiram Rd, Wyreema QLD 4352.
1st Friday each month, 7.30pm. Lutheran Church Hall, cnr West and Alderley Sts, Toowoomba.

SOUTH AUSTRALIA

- **Native Orchid Society of South Australia Inc.:** PO Box 565 Unley SA 5061 - (08) 8261 1550
4th Tuesday each month, 8pm. St Matthew's Hall, 67 Bridge St, Kensington

VICTORIA

- **ANOS Geelong Inc.:** 2 Cooper St, Melton South VIC 3338 - (03) 9743 6040.
2nd Wednesday each month, 7.30pm, Uniting Church Hall, Moorabool St, South Geelong.
- **ANOS Victoria Inc.:** PO Box 308, Boronia VIC 3155 - (03) 9387-2771.
1st Friday each month, 8pm. Toorak Uniting Church Hall, 603 Toorak Rd, Toorak (Melways 58 K4)
- **ANOS Melbourne Suburbs Group:** PO Box 169, Bayswater VIC 3153 - 0419 720 355.
4th Wednesday each month, 7.30pm. Montrose Primary School, Leith Rd, Montrose 3765 (Melways 52 D7)

WESTERN AUSTRALIA

- **ANOS Western Australia Inc.:** 27 Maidment Parade, Dalyellup WA 6230 - 0419 901 335.
2nd Monday each month, 8pm. Wilson Community Hall, Braibrise Rd, Wilson.

The Australasian Native Orchid Society Inc.

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ANOS Awards CD

- \$20 plus postage
- CD containing award pictures and fact sheets for each award made by ANOS.

A Checklist of Australian Native Orchid Hybrids—9th Edition (2010)

- Hybrid checklist of all Australian Native Orchid Hybrids

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Pterostylis daintreana
Pterostylis grandiflora
Cryptostylis erecta
Genoplesium filiforme
Diuris lanceolata
Rimacola elliptica

• Set 2

Pterostylis sanguinea
Pterostylis depauperata
Acianthus caudatus
Caladenia concinna
Chiloglottis truncata
Dendrobium kingianum
Sarcochilus australis
Dendrobium striolatum

• Set 3

Dendrobium moorei
Lyperanthus nigricans
Dendrobium bowmanii
Eriochilus cucullatus
Pterostylis vittata
Sarcochilus ceciliae
Sarcochilus falcatus
Cymbidium canaliculatum

Contact the treasurer with regard to availability of these items and in order to arrange payment.

Meeting Planner: Each row is a week in the month—first at top, fourth at bottom. For instance, Macarthur and Districts ANOS meets on the 3rd Thursday each month.

Weekend	Monday	Tuesday	Wednesday	Thursday	Friday
1st Week		Townsville		Beenleigh	Toowoomba Victoria
2nd Week	Western Australia	Illawarra Kabi	Central Coast Geelong	Mackay & District	
Far North Coast (Sat)	3rd Week	Warringah		Macarthur & District	Sydney
Mid-North Coast (Sun)	4th Week	South Australia	Melbourne suburbs	Newcastle	



Dendrobium tangerinum 'Blackalls', grown by Fred Fear, was one of a number of species awarded by ANOS judges in 2013. See article on page 520. Photograph by Bill Dobson.

Bulbophyllum graveolens is one of the New Guinea species classified as *Dendrobium* and *Cirrhopetalum* at times in the past, but confirmed in *Bulbophyllum* in GO6. See article on page 496.

